JULY 1954

American Engineer

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IN THIS ISSUE . . .

- **SURVEYING THE ROAD AHEAD**

By Clarence T. Shoch, P.E.
NSPE's New President

President Shoch Urges a Year of Professional Service

. . . *Also*

Hawaii and the Engineer, A Story of Achievement By William J. Hull, P.E.

•

Capsule Advice For Young Engineers By Eight of Today's Leaders

•

Plus An Account Of the Annual Meeting and Other Features

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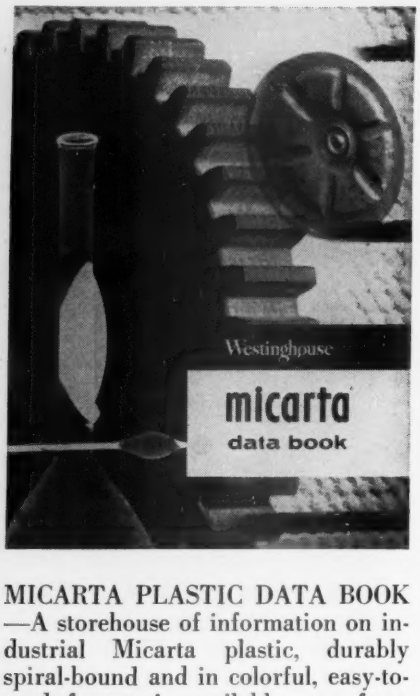

MICARTA PLASTIC DATA BOOK —A storehouse of information on industrial Micarta plastic, durably spiral-bound and in colorful, easy-to-read format is available now from Westinghouse Electric Corp. This 50-page handbook was prepared for the designer and user of industrial materials. Color-keyed for convenient reference, the three main sections discuss Laminated Micarta, Molded Micarta, and Machining Data. Not only are the explanations of the uses, grade and property data, design and applications quickly understood in the crisp presentation but postage-free invitations are included if additional information is desired. For your copy: Write Westinghouse Electric Corp., P.O. Box 2099, Pittsburgh 30, Pa.

—AE—

LIGHT METALS PUBLICATION —A 54 page booklet in two colors has just been published by the Aluminum Company of America. Sixty-five years of work in the Aluminum Research Laboratories are described in this booklet entitled, "Research at ALCOA." It provides a bibliography of technical articles about aluminum and lists more than 1000 books, technical papers and articles prepared by Alcoa research scientists in the last 35 years. This is a reference useful for industrial and college laboratories and libraries. Copies may be obtained from Alcoa Sales Offices or from Aluminum Company of America, 726 Alcoa Building, Pittsburgh 19, Pa.

CHARTING PUBLICATION — The publication of a 16-page brochure describing the Chart-Pak method of prefabricated charting of statistical charts, organization charts and office lay-outs has just been announced. The brochure contains material explaining this pre-fabricated method of charting plus facsimilies of the pressure-sensitive components. Copies are available from Chart-Pak, Inc., Stamford, Conn.

—AE—

CALCIUM CHLORIDE in CONCRETE MANUAL—Emphasis is given to the aspects of year round use of calcium chloride in concrete in a new 40-page manual just published by the Calcium Chloride Institute. While most concrete users know the benefits of calcium chloride in cold weather there may be some who do not realize that it can be used as effectively in warmer temperatures. The Manual states that at 70° and colder, calcium chloride is most effectively used at the rate of 2% by weight of cement in the mix; while similar advantages may be gained in temperature above 70° by using calcium chloride at the rate of one per cent per bag of cement in the mix. The data based on more than 25 years of research and field investigations deals with the use of calcium chloride in portland cement concrete and such topics as: initial and final set, early strength, ultimate strength, curing, workability and density, resistance to surface wear; air-entrained concrete and other phases. Your copy of Manual CM-1 may be obtained by writing: Calcium Chloride Institute, 909 Ring Building, Washington 6, D. C.

—AE—

MINERAL SEPARATION BULLETIN—New separation equipment for use in testing samples of ores, designing of flowsheets and complete mill equipment is explained in a new bulletin issued by Carpco Engineering and Manufacturing. These high tension, electrostatic and magnetic separators not only are pictured but detail diagrams of the action are helpfully included. For your copy write: Carpco Engineering and Manufacturing, Jacksonville 6, Florida.

First Aid Helps For Fall Programs

Do you want programs that fairly sparkle for your 1954-1955 schedule of meetings. There's nothing like making use of visual aids to step up enthusiasm and to boost attendance at your meetings!

The AMERICAN ENGINEER "New Literature" feature lists these two films as helps to program chairmen in planning meetings for the new season. Notice of others will be given to you as we receive them.

A new 16 mm color motion picture with sound, "Whatever We Do," has just been released by Air Reduction Sales Co. It is a basic documentary film about the atmospheric gases, covering their key uses in industry, and the ways in which they appear in our daily lives as parts of familiar products. Running time: 23 minutes.

The film may be borrowed from any Air Reduction district office or by applying to: Air Reduction Sales Co., 60 East 42nd St., New York 17, N. Y.

"Making the Most of the Spray Painting Method" may be borrowed from DeVilbiss Co. This 16 mm sound film shows the four basic principles of spray finishes. In conjunction with the film, DeVilbiss has prepared a booklet which covers the film highlights and which also serves as a ready reference. The company plans to give a copy to every person who views the film. Running time: 45 minutes.

The film may be obtained for showing by writing: DeVilbiss Co., 300 Phillips Ave., Toledo 1, Ohio.

Consult the New Literature feature of the January, February and March issues for more film titles.

Letters

Ethics for Engineers . . .

Dear Editor:

This is in reference to the "Canons of Ethics for Engineers" adopted by the Engineer's Council for Professional Development, October 25, 1947, and endorsed by the National Society in 1948.

In discussions with engineers in various localities, it has become evident to me that very few of the engineers know that there are ethical practices to be observed in our profession. I have found many salaried engineers have been making a practice of doing professional engineering work in their spare time at extremely low fees, thereby creating a feeling in the area that the self-employed professional engineers are exorbitant in their fees. This is contrary to Section 27 in the "Canons."

Situations like these come about because most engineers are not aware that we, also, have an oath, not a Hippocratic Oath, but one, nevertheless, which we assume when we enter the profession. I, therefore, urge you, in collaboration with ECPD, to utilize the medium of the AMERICAN ENGINEER and print a full-page copy of the "Canons of Ethics for Engineers" which each engineer may, if he desires, cut out for future reference.

I believe that by bringing "ethics" to the attention of the engineers who are not aware that they exist, you will be acting in the public interest and further benefit of the profession.

A. WISE, P.E.,
Patchogue, N. Y.

Plaudits for Sturgis . . .

Dear Editor:

Congratulations on the excellent article by Major General Samuel D. Sturgis, Jr., Chief of the U. S. Army Corps of Engineers, in your May issue. As a practicing consulting engineer and a former instructor in both public high schools and engineering colleges, I heartily endorse his concern over the general drift in public schools away from mathematics and sciences toward the so-called "social studies."

As Major General Sturgis expresses it, ". . . The mental discipline of the three R's has been thrown overboard in favor of 'happy well-adjusted children'." I feel he is also on firm ground in his rather caustic criticism of the "thoroughness" of teaching in mathematics for the few students who are exposed to it. The results he cited of a test given the freshman class of the University of Michigan in which approximately one-third of the students could not multiply two mixed numbers or express a fraction as a decimal should give us all reason to question some of the current trends in education.

JAMES P. O'DONNELL, P.E.,
New York, N. Y.

Another Viewpoint . . .

Dear Editor:

The article by Major General Samuel D. Sturgis, Jr., Chief of the Army Engineers, is most interesting, especially as indicating the needs of the Army Engineers for professional engineers.

Recently I called to the attention of the Adjutant General's Office the fact that one of our recent civil engineering graduates with some construction experience after being drafted had been assigned to a field radio repairman school where he was the only college graduate in his class. In reply, I received an explanation of the Army program for the "Utilization of Enlisted Scientific and Professional Personnel" but it was pointed out that "in the case of civil engineers the Army has found that selecting personnel who possess a master's degree or a bachelor's degree plus two years work experience results in filling all Army requirements for enlisted civil engineers."

There certainly appears to be some inconsistency between General Sturgis' point of view and that of the Adjutant General, and I wonder who is trying to kid whom! Is there any wonder that we in engineering education sometimes get a bit confused and even critical of the military use of our graduates? We are not asking for commissions for them but simply reasonable use of their education and experience.

G. A. MARSTON, P.E.,
Dean of Engineering
University of Massachusetts
Amherst, Mass.

Nuclear Engineering . . .

Dear Editor:

I have just read in the May issue the article entitled "Nuclear Engineering: the Newest Branch," by Leonard E. Johnston, P.E. I disagree with Mr. Johnston's thesis that nuclear engineering should be considered as another branch of our profession to which the State Boards of Engineering Examiners should grant registration.

I have been engaged in the nuclear energy program since 1944 and presently teach the courses in Nuclear Science and Engineering at New York University. To me nuclear engineering is another industrial specialty just as we may classify as specialties petroleum and petro-chemical engineering, synthetic fibres engineering, resins and plastics engineering, pulp and paper engineering, etc.

Mr. Johnston's own arguments can be used to contradict his thesis:

1) This is an industry which has become immense in scope and size by applying the normal engineering approach to completely new problems.
2) The engineers now serving satisfactorily at the National Reactor Testing Station near Idaho Falls, Idaho, are well divided among the conventional branches of engineering and were not trained as nuclear engineers.

(Continued on page 39)

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JULY, 1954

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•

To achieve a civilization based on human values requires the desire within ourselves. If we actually have that desire, our scientific, industrial, and military forces will fall, automatically, into line behind it, supporting with material strength the human qualities essential to over-all power and permanent survival.

—BRIG. GEN. C. A. LINDBERGH

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• SPECIAL ARTICLES

Surveying the Road Ahead 8
By NSPE President Clarence T. Shoch, P.E. Professional service opportunities are detailed by the National Society's new president.

Hawaii and the Engineer 10
By William J. Hull, P.E. A leading Hawaiian engineer tells how the Territory makes the most of its natural resources

If I Were A Young Engineer Today 14
A symposium of advice for newcomers to the profession by eight distinguished leaders in the engineering field.

Milwaukee Meeting Story 19
An account of NSPE's Twentieth Annual Meeting with emphasis on important Board of Directors decisions.

An American Engineer Special Report 21
Subject: Industrial Defense in the Atomic Age

• REGULAR FEATURES

Letters 3
Professional News Briefs 6
From Washington 17
Professional Postscripts 23
NSPE Believes—Engineers for the Future 26
Book Looks 27
With Our Members .... 28 Strictly Business 41

New Literature ..... Inside Front Cover
Professional Directory 30, 31, 32, 33
Classified ..... 36 Contractors Directory . 39
New Processes ..... 40 Advertisers' Index 40
What's New—New Products of Interest 42

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NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS
FOUNDED 1934

What General Electric people are saying . . .

E. KEONJIAN

Formerly an electronics scientist in Leningrad, Mr. Keonjian is now with the Electronics Division

". . . There is considerable progress in science, particularly in applied fields, such as electronics, in Russia. There are several reasons for it.

First, the Soviet Government encourages development of applied science in every field which has any prospects of being useful for military purposes.

Second, in the atmosphere of strong political pressure and frequent "purges" in which every individual lives in Russia and in satellite countries, many people regard applied sciences as relatively "safe subjects" that often do not follow all the changes and zigzags of the Communist Party line, as in the case of social science. Consequently, more people devote themselves to applied sciences rather than to any other sciences or activities.

Third, the Soviet scientists have to study the foreign languages more intensely than we do here. They watch very closely all foreign scientific and technical developments and make more efficient use of them than we do.

Fourth, the Soviet Government has complete control over the school system in Russia. It determines their programs, number of students, and their assignments after graduation.

Fifth, unlike the Western world, the Soviet Government is able, without any limitation, to concentrate the selected manpower of the country, as well as the full effort of its technology, in few selected fields which it regards vital for increase of military potential.

There is a prevailing opinion among the Western scientists that we strongly underestimate Soviet science. With few exceptions this is, however, not true. The Western scientists should always remember that together with some real achievements, there is still a considerable amount of propaganda, outward manifestation, and even charlatanry in most of the Soviet claims in science, and the tragic disgrace of Prof. Lysenko's "achievements" in Soviet genetics is not without parallel in other sciences behind the Iron Curtain.

at the IRE, Pennsylvania Section

F. K. McCUNE

Mr. McCune is General Manager, Atomic Products Division

". . . We at General Electric believe that electric companies will be owning and operating a number of atomic power plants within the next ten years.

We believe some of these will be full-scale and, what is most important, they will operate electrically at competitive costs, possibly within five, certainly within ten, years.

We believe that this will be accomplished without Government subsidy for production plant construction or operation, and that Government-supplied fuel will be priced at cost-of-production levels.

We believe that two nuclear reactors best suited for earliest and most effective competition with conventional fuel plants in this country are (a) the light water-moderated and cooled boiling reactor, and (b) the graphite-moderated water-cooled reactor. These we think hold greatest promise in the years just ahead.

In saying these production plants will operate without Government subsidy, I do not wish to detract from the immeasurable significance of knowledge developed through A.E.C. contracts. Of course, the Government's large expenditures for research and development of plutonium production reactors, mobile power reactors, and other power reactors form the base from which private industry can proceed. But, the important thing here is that we believe production size atomic power plants can be made economic. They will stand on their own feet. They may sell products to the Government. They will certainly buy nuclear fuel from the Government. But, trading with the Government need not be a subsidy.

Atomic Industrial Forum Panel
Washington, D. C.

W. S. HILL

Mr. Hill is Manager—Technical Recruiting Services, Engineering Services Division

". . . In the matter of educating the technical graduate, what industry is trying to say to educators concerning the engineer and the scientist is this:

Give us well-rounded men.

Cultivate habits of mind that will enable them to seek out unsolved problems, to systematically explore, and where possible to add to useful knowledge.

Give them basic tools in the form of fundamental knowledge for this task, but above all show them how to acquire more tools for themselves as they reach the limits of their past training.

Encourage qualities of initiative and responsibility.

Make them aware of the economic evaluation society will inevitably put on their contributions.

Help them toward attitudes of cooperation with their associates in work and community because much of their lives will be spent in working with and for people.

Prepare them to better adjust to people, situations, and the changing complexities of our society.

Foster alertness to broad social trends and the implications these have to their field of work.

G. E. Review

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Professional News in Capsule Form

William F. Ryan and Thomas E. Murray Receive Honorary Degrees • New Directors Named by Atomic Industrial Forum • AIEE Honors Prominent Engineers • Employment Trend Reported • Other Items of Interest

Former NSPE Vice President William F. Ryan received an honorary Doctor of Science degree from The Catholic University of America during its commencement exercises in Washington, D. C., on June 8. The degree was conferred on Mr. Ryan, who is vice president and senior consulting engineer with the Stone & Webster Engineering Corporation of Boston, in recognition of his "distinguished services in the field of engineering, with particular reference to the spiritual and moral aspects of the profession."

* * *

Similarly honored at The Catholic University commencement was another distinguished NSPE member—Atomic Energy Commissioner Thomas E. Murray of New York. Mr. Murray also addressed the graduating class, making the widely-reported proposal that the United States stage a "modern war in a capsule," inviting world leaders to a demonstration of hydrogen and atomic weapons to impress upon all peoples the urgency of the need for peace.

* * *

More than one hundred private firms are now members of the recently-established Atomic Industrial Forum, Inc., according to Walker L. Cisler, head of The Detroit Edison Company, who is president of the group.

In addition, six more executives have been elected to the Forum's board of directors. The new board members are: Gordon Dean of Lehman Brothers, former chairman of the U. S. Atomic Energy Commission; Frank Pace, Jr., executive vice president, General Dynamics Corporation; Arthur H. Bunker, president, Climax-Molybdenum Company; Leonard W. Cronkhite, president, Atomic Instrument Company; J. Carlton Ward, Jr., president Vitro Corporation of America; and A. C. Monteith, vice president, Westinghouse Electric Corporation.

The main objective of the Forum is to assist industry in the development of atomic energy for constructive, peacetime purposes.

Announcement of the election of A. C. Monteith of Pittsburgh, Westinghouse Electric vice president and a new member of the Pennsylvania SPE and NSPE, to the presidency of the American Institute of Electrical Engineers was made during the AIEE summer meeting in Los Angeles.

G. J. Crowdes of Cambridge, Mass., Simplex Wire & Cable Co. chief engineer and a member of the Massachusetts SPE and NSPE, is among the newly-elected AIEE vice presidents. The others are: J. P. Newbauer, Claude M. Summers, S. M. Sharp, and John R. Walker.

The new officers will take over the Institute's administration on August 1.

* * *

Two other NSPE members have also been honored recently by the AIEE. Ross D. Brown, chief engineer of the Monongahela Power Co., Fairmont, W. Va., and Charles T. Hatcher, division engineer with Consolidated Edison Co., New York, are among seven leading electrical engineers who have been made fellows of the Institute in recognition of outstanding achievements in their field.

Mr. Brown's citation was "For his initiative in direction and engineering development of a statewide electric power system," while Mr. Hatcher was honored "For service and leadership in research and engineering of electric power cables and their application."

* * *

A trend toward the laying off of older engineers (those 45, 50, and older) by some companies and subsequent difficulties encountered by these same men in acquiring other engineering positions have been reported in the June 5 issue of "Industrial Relations News," a weekly newsletter in the industrial relations field. The trend is reportedly more prominent in the east, the newsletter states, while not so pronounced in the Middle West, and on the West Coast the engineering employment market remains fairly tight. Types of engineers most affected, according to the newsletter's information, are civil and mechanical.

* * *

NSPE's first president, Dr. David B. Steinman, received the

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Foreword by **Fleet Admiral William D. Leahy, USN**

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honorary degree of Doctor of Civil Engineering in a special ceremony June 30 at the University of Bologna in Italy, reportedly the oldest university in the world.

Dr. Steinman has been visiting Italy for conferences with the authorities in regard to the development of plans for the financing and construction of the Messina Straits Bridge to connect Italy and the island of Sicily. The projected suspension bridge, which has been designed by Dr. Steinman, is to have a main span of 5,000 feet, which will be the longest such span in the world.

* * *

Plans are going forward for five major national meetings of The American Society of Mechanical Engineers during 1955 in conjunction with the organization's 75th anniversary observance.

Dr. Jess H. Davis, president of the Stevens Institute of Technology and chairman of ASME's 75th Anniversary Committee, has announced that the theme for the observance will center around "the engineer and his relationship with the world in which he lives and works."

The specific theme of the first major meeting, scheduled for February 16, 1955, in New York, will be "The Engineer and His Communications." The second meeting, to be held April 7 at Stevens Tech in Hoboken, N. J., will deal with "The Engineer and the World of Education." "The Engineer and the World of Government" will be the discussion topic for the April 18-21 meeting scheduled for Baltimore, while "The Engineer and the World of Science" will be the background theme for a June 20-23 meeting in Boston. Finally, the fifth national meeting in Chicago, November 13-18, will deal with "The Engineer and the World of Commerce and Industry."

* * *

George J. Nicastro, district representative of Combustion Engineering, Inc., New York, and a prominent NSPE member, has been elected president of the Alumni Association of Stevens Institute of Technology, Hoboken, N. J. Mr. Nicastro, who was graduated from Stevens in 1925, is a resident of Glenville, Conn., and is recognized as a leader in professional engineering activities. He is a trustee of the New York State SPE and a member of the New York Chapter's Research and Policy Committee.

* * *

Wallace D. Barlow, a member of the District of Columbia SPE, has recently been appointed head of the Resources Unit in the Office of Naval Material, Department of the Navy. The unit is concerned with the availability of the metals, minerals, fuels, and other basic materials required by the naval establishment.

* * *

The thirty-third annual meeting of the National Council of State Boards of Engineering Examiners has been scheduled for the Hotel Saint Paul in St. Paul, Minnesota, August 26-28.

* * *

The American Society of Agricultural Engineers has awarded its John Deere Gold Medal to Raymond Olney of St. Joseph, Mich., and the Cyrus Hall McCormick Gold Medal to Wayne H. Worthington of Waterloo, Iowa. The two awards are given annually to honor outstanding engineering achievement in the field of agriculture.

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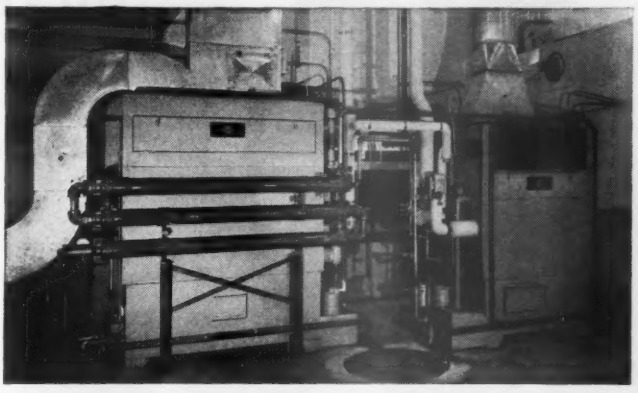

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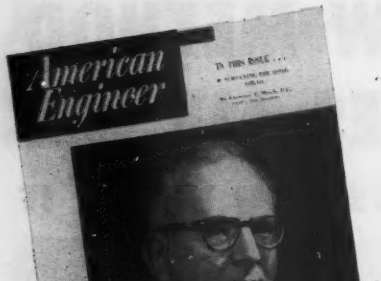


Opportunities Abound for All
In Professional Service

Surveying the Road Ahead

By CLARENCE T. SHOCH, P.E.,
President, National Society of Professional Engineers

SERVICE is its own reward. At least I have found it so in professional engineering work. To be afforded the far broader service opportunity that is a part of the presidency of the National Society of Professional Engineers is, at one time, added honor and a further challenge. For both I am grateful. I shall do my best to advance the interests of the engineer as a professional man, and to promote the Society as the accepted medium for bringing this about.

Opportunities abound for all of us in professional service — opportunities which safeguard the public while bringing it tomorrow's comforts and conveniences; opportunities which make engineering work better known and valued while causing it to be even more deserving of appreciation; opportunities which raise the social acceptance of engineers and earn for them advancement in an economic sense.

The year ahead is not without its full quota of needs to be served. Some have profession-wide implications. All affect us as individuals, although perhaps in varying degrees. One of particular concern is in the category of "putting out a fire." This is the need for calmly and intelligently, albeit quickly, developing among engineers and their employers the understanding that the work of the engineer in the form of applied ideas is as much a management-type contribution to production as is the financing that provides the production plant. It behooves engineers to so regard their employment. Managements likewise should take this factor into consideration in working out the conditions of engineering employment.

A realization of proper employer-employee relationship and general application of the principle just stated should go far toward relieving the feeling among engineers that they must have professional union protection. Aside from the aspect of fair treatment, a satisfactory employer-employee relationship will help avoid another factional issue and superficial stratification within the profession.

The problems facing young engineers comprise another specific field calling for mature consideration. Here the man entering the profession is temporarily confused not only by the union situation, but also by uncertainties in the technical specialty he should pursue, the conflicting viewpoints as to the desirability of registration and the lack of uniformity among the registration laws of the various states.

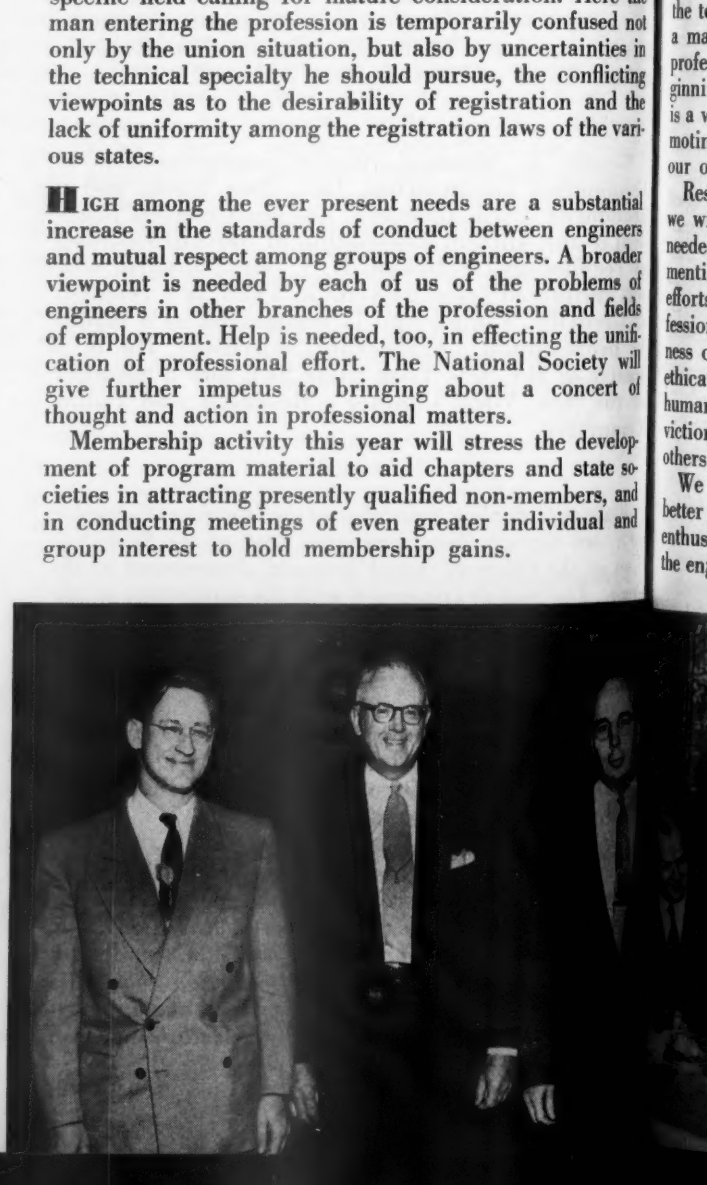
HIGH among the ever present needs are a substantial increase in the standards of conduct between engineers and mutual respect among groups of engineers. A broader viewpoint is needed by each of us of the problems of engineers in other branches of the profession and fields of employment. Help is needed, too, in effecting the unification of professional effort. The National Society will give further impetus to bringing about a concert of thought and action in professional matters.

Membership activity this year will stress the development of program material to aid chapters and state societies in attracting presently qualified non-members, and in conducting meetings of even greater individual and group interest to hold membership gains.

Service means participation at all levels of professional activity. In the first photo at the right, President Shoch (center) is pictured with D. F. Langenwalter (left), new president of the Schenectady Chapter, NYSSPE, and T. M. Linville, new president of the NYSSPE.

The first photo on the opposite page shows a typical Engineers' Week banquet scene, with J. J. McBrearty, vice pres., Anthracite Chapter, Pennsylvania SPE; E. A. Walker, dean of engineering, Penn State; and W. H. Lesser, State Registration Board member, seated l. to r.; and J. T. West, PSPE executive secretary, C. M. Robb (since deceased), Anthracite Chapter pres., and Mr. Shoch, standing.

The final photo was taken at a National Society annual meeting. Seated in the foreground are L. L. Dresser and John D. Coleman, while standing, l. to r., are: Russell B. Allen, T. Carr Forrest, Jr., Mr. Shoch, C. Y. Thomas, and E. W. Seeger.



Important too will be the observance of Engineers' Week, with increased emphasis on broadening the present local interest to one of true national observance. In legislative matters, the careful screening of national and area-wide developments affecting any phase of the engineering profession will continue. In addition, National Society work this year will provide appropriately for a review of ethical matters, renewal of data on salaries and fees, and encouragement of uniformity of registration laws.

Each of the specific objectives is spearheaded by a committee. Its work is aided and made effective through the efforts of other committees working on chapter activities, public relations, legislation and related items. All committees are capably manned and, to the degree possible, adequately financed. Men of comprehensive understanding and mature judgment comprise the board. My associate officers in the administration are eminently fitted to knit together and put into action all phases of the program. The headquarters staff, while too limited in numbers for maximum desired output, nevertheless is well qualified and energetic in producing the materials that are of service to our membership.

WORTHWHILE accomplishments in a professional sense are possible only by individual effort at all three levels of our organization—chapter, state and national. Humble beginnings are all that any of us can make. Work diligently in your chapter's activities, and encourage others to take a part. Your state society needs your help and counsel. The National Society, too, welcomes your participation. Cooperate locally with engineering groups and the technical societies. All these carry the assurance that a man's personal value, and the public regard for his profession, will be materially enhanced. The smallest beginning in the acceptance of professional opportunities is a worthy start on the larger job of defending and promoting the way of life that has been made possible by our own contributions.

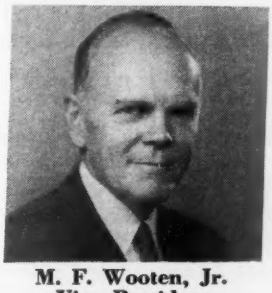
Resolve with me, if you will, that during the year ahead we will do our utmost to encourage and participate in needed profession-wide activity along the several fronts mentioned. As individual members, let us dedicate our efforts in keeping with the premise that a mark of professionalism is the way a man applies himself to the business of working and living. In so doing, we shall adapt ethical standards to circumstances, balance learning with human experiences and be open-minded while of firm conviction. We shall accept responsibility for the actions of others, all the while tending our own.

We are by training and experience the builders of a better way of life. Let us carry the same concept enthusiastically into matters of professional interest, that the engineers' professional estate too may prosper.

NSPE Officers, 1954-55

Louis F. Frazza
Vice President
Northeastern Area

R. J. Rhinehart
Vice President
Southwestern Area



M. F. Wooten, Jr.
Vice President
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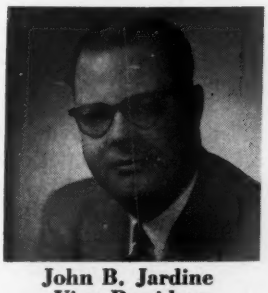
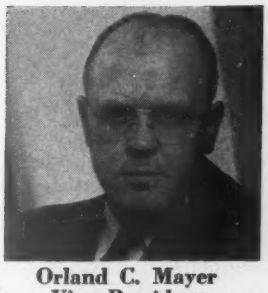
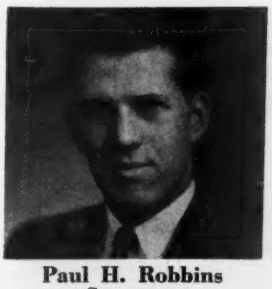


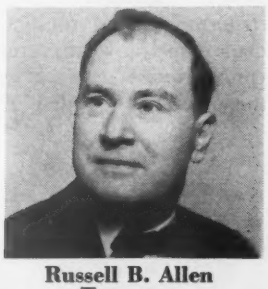
John B. Jardine
Vice President
North Central Area



Orland C. Mayer
Vice President
Western Area



Paul H. Robbins
Secretary



Russell B. Allen
Treasurer

Water, Sunshine, and Lava

Hawaii and the Engineer

By

WILLIAM J. HULL, P.E.,

President, Engineering Association of Hawaii

THE role that engineering has played in the development of the Territory of Hawaii has been of vital importance and characterized by many unusual conditions and problems, many of them caused by the topography and geology of the Islands.

Where else would an engineer be confronted with the problem of building a road over a hot lava flow, the temperature of which, three feet below the surface, was 800°F.? Where else would he find the average annual rainfall varying from 20 to 450 inches within a distance of fifteen miles, or locations where a 120-foot pile with poor bearing is within three feet of a 40-foot pile with excellent bearing? Where else would an engineer find it necessary to offset a tunnel when he struck a large cavern right at tunnel grade or discovered ten different types of material in one hundred feet of tunnel? Probably not all of these and many other unusual problems are entirely peculiar to Hawaii but the engineer in these islands certainly is confronted more often than not with the unusual. This, coupled with the fact that Hawaii is 2,400 miles from the Pacific Coast and must ship from the U. S. mainland practically everything needed for construction except rock and sand, requires that the engineer plan his work carefully and far in advance. No advance planning is perfect, however, and while awaiting those vitally needed materials and replacements that "missed the boat" the Hawaii engineer's ingenuity is frequently taxed to its utmost. In effect, he must be a "jack of all trades."

The Hawaiian Islands were first discovered by Captain Cook in 1778, although some historians have it that Spanish ships visited the archipelago as early as 1555.

The Protestant missionaries arrived in 1820 and in 1842 the United States recognized the Kingdom of Hawaii. All land belonged to the king absolutely until 1848, when he then divided all the land in the kingdom into three parts. He kept for himself the first part, most of which eventually became government land. Another third he gave to his chiefs in large parcels. These ultimately became large estates. The remaining third he gave to the common people. The lands were designated mostly by Hawaiian names and while some surveys were made, they were frequently tied in to "the large tree," or "the big rock." This resulted in a system of land titles and water rights that presents many perplexing problems today to the engineers and particularly to the surveyors who must be able to interpret ancient Hawaiian descriptions accurately as part of their registration examinations. The Torrens system of land titles was made available to persons wishing to perfect their titles in 1903. To date, however, only about 10 per cent of the lands in the Territory have been so registered.

Doak Cox, left, Hawaiian Sugar Planters' Association Senior Geologist, is pictured discussing a proposed water development project on the island of Oahu with William J. Hull, right, the author of this article and a well-known engineer in the Territory.

The oldest engineering works in the Territory are of unknown age and were probably the contour ditches and diversion dams constructed by the ancient Hawaiians to convey water from the streams to their taro patches. The skill of the native Polynesian engineer is evidenced by the long ditches and by flumes built from hollowed logs. King Kamehameha, who consolidated the islands under one rule in 1795, dug the first tunnel to convey water from one valley to another.

The development of Hawaii was gradual until about 1898 when the Republic of Hawaii was annexed as a Territory of the United States by request of the people of Hawaii. The seat of the Territorial Legislature today is the former royal palace of the Kingdom, the only royal palace on United States soil.

The five principal islands of the Hawaiian chain vary from 260 sq. miles to 4,030 sq. miles in area and from sea level to 13,750 feet in elevation. The population of the Territory is now 480,000.

With the exception of minor amounts of coral limestone and other sedimentary rocks formed subsequent to the volcanic growth of the Islands, the entire mass of the Islands of Hawaii consists of thin lava flows mostly of basaltic composition but varying greatly in character. Two volcanos are active periodically while two others have been active within the last two hundred years. Erosion has formed rugged amphitheater-headed valleys. The topography presents a fascination to the geologist, numerous difficulties to the engineer and a great amount of rock excavation to the contractor. With no oil or minerals, the Territory's natural resources boil down basically to water, sunshine and decomposed lava soils, in which world record crops of sugar and pineapple are raised.

Sugar gradually replaced taro and rice as the major crop and became an irrigated crop in some areas as early as 1856. Irrigation consisted originally of diverting the streams from the amphitheater-headed valleys, few of which have a watershed area of more than five square miles. The lava rock is so porous that surface storage of water is not practical in most locations and even in the few cases where fairly tight reservoir sites exist, the volume of storage is small without excessively high and costly dams.

Two events caused the large expansion of the sugar industry, which is still the principal industry of the Islands. The first was the discovery of artesian water in the coastal plains near Honolulu in 1879, and the second, annexation. Annexation of the Republic of Hawaii with the United States loosened considerable capital, much of which was used to construct extensive water collection and irrigation systems in the early 1900's. Miles of tunnels were driven in the mountains to intercept the water from the valleys. The Kohala Ditch is one fine example of early engineering skill by M. M. O'Shaughnessy and Jorgen Jorgensen. The Ditch contains 16 miles of tunnel in an area so inaccessible that even today it has to be reached on mule back. All except one-half mile was done by hand drilling.

When one stops to think of the old rule of thumb that it takes one ton of water to produce one pound of sugar and when one realizes that the Hawaiian sugar industry produces 1,100,000 tons per year, it gives some idea of the enormous quantities of water that are developed and pumped. Water development and irrigation facilities have cost the plantations an average of about $375.00 per irrigated acre which if duplicated today would cost nearer $900.00 per acre. The sugar industry's accomplishment is due in a great part to the Hawaiian Sugar Planters' Association, a research organization supported by all the

Above, in picking pineapples, the conveyor is carried by a truck with bulk pineapple bin. When the bin is full, the conveyor is raised by hydraulic jacks, the truck drives off, and another truck with an empty bin takes its place.

Modern mechanical methods of harvesting sugar cane in Hawaii are shown above. Cane hauling units carry a pay load of from 30 to 40 tons of cane. A bulldozer cane rake is shown in the center background.

The view of a portion of Honolulu harbor, below, shows the new waterfront arterial highway.

Cliffs 4,000 feet high flank Waimanu Valley on the Island of Hawaii. Water from higher levels is conveyed by tunnels and ditches to distant plantations.

The aerial photo and drawing at the left shows two Oahu trans-mountain routes which are now in the earliest stages of construction. A portion of the City of Honolulu appears in the foreground.

sugar companies on a basis of their production. In addition to agriculturists, entomologists and many other scientists, their mechanical engineering department has been instrumental in working with the plantation engineers to develop labor-saving machinery to combat the ever-growing cost of labor. About three million dollars per year is expended by the H.S.P.A. and the sugar companies on research. Plantation labor in Hawaii today is the highest paid agricultural labor in the world. Last year 1,100,000 tons of raw sugar were produced by 20,919 employees on 221,542 acres of land as against a slightly less tonnage by 52,264 employees on 257,661 acres of land twenty years ago. The sugar industry provides year-round employment for its employees. Seasonal labor is not required, since crops are planned on a 24-month cycle, and planting, cultivating, harvesting and manufacturing are carried on the year-round. The war and the accompanying shortage of sugar bags hastened the conversion of the sugar industry from bag to bulk handling. This conversion will be complete by 1955. It was necessary to develop complete new equipment for handling bulk sugar at the mills, for transporting it to the docks, for storing sugar at the various piers, for loading the vessels, as well as converting the freighters and providing special means for unloading the sugar at the mainland refinery. The bulk sugar handling facilities stand as a monument to the mechanical engineers. Studies are now underway to determine the feasibility of using the sugar cane bagasse for the production of newsprint and paper. At present a small amount of bagasse is used for making wallboard while the rest is used for fuel. Developments in the mechanical line are never-ending and will present challenges to the mechanical engineers for many years to come in the sugar industry, as well as in pineapple production, the Territory's second largest industry.

THE pineapple industry grew from a few small canneries in the early 1900's to today's production of about 29,000,000 cases per year, 70 per cent of the world's crop.

Pineapple, coming after sugar was well established, absorbed much of the good agricultural land at elevations above the economical pumping limits of water for sugar production. Until recently, pineapple was an un-irrigated crop. However, droughts of several months' duration in the past few years have hurt crops to the extent that portable irrigation facilities are beginning to appear. Within a few years, crop failures due to drought should be a thing of the past. No part of the pineapple goes to waste. Besides canned fruit and juice, by-products include cattle feed, citric and ascorbic acid, alcohol and vinegar. With the exception of the initial planting of the pineapple slip in the ground and the act of plucking the ripe pineapple from the plant at harvest time, two problems the mechanical engineers have not yet been able to solve satisfactorily, neither the plant nor the fruit are touched by human hands, until the can of pineapple is opened by the consumer.

There were four major engineering milestones which have greatly assisted in making the pineapple industry what it is today. The first was the invention by Henry G. Ginaca in 1912 of a machine which peels and removes the core of the pineapple. Another was the development of sprays and spraying machines as early as 1916 to control pests and more recently to control weeds. The development and use in about 1919 of mulch paper and the machines to lay it was a third, while after World War II, the conversion to bulk handling of pineapple was a major step forward.

Probably the amount of construction immediately prior to and during World War II by the armed forces in Hawaii will never be known except that the total cost must have exceeded a billion dollars. The role played by contracting groups in defense construction in the islands is well told in a book by Daniel O. Woodbury entitled *Builders for Battle*. The largest and most unique of the projects related is the $45 million underground multiple oil storage tanks which hold enough oil to float 15 battleships. All tanks have at least 100 feet of natural rock cover and are each 250 feet high and 100 feet in diameter.

As the defense line moved westward from Hawaii there remained many surplus military facilities, most of which are located on the Island of Oahu. On one occasion in 1945 Pearl Harbor housed over 500 ships; hence now many of the facilities to handle these ships are unused. Many surplus airfields and other military installations are now unused. Some are being converted to civilian uses. Postwar military projects have been mostly in the nature of rehabilitation of existing facilities to meet today's requirements, and projects of this type will probably continue for quite a few years.

The Honolulu city proper is fortunate in having had its water supply carefully planned since 1930 by a commission ably managed by Frederick Ohrt, honorary member, A.S.C.E. Prior to 1935, most of the city's supply was derived from wells drilled in five artesian areas within the city limits. By means of sealing or recasing any well either public or private that showed any head deficiency, consumption and waste which previously had exceeded all reasonable limits was greatly decreased. When one stops to realize that the Island of Oahu with an area of only 604 square miles will use in excess of 500 M.G.D. of water at times, the necessity for conservation is apparent. By means of conservation the need for the development of new sources was deferred many years. The method of obtaining new water thereafter was changed from wells to shaft and tunnel developments. This type of water development is placed as far inland and at as low an elevation as the economics of excavation and pumping costs dictate. A shaft is driven to sea level and a horizontal collection tunnel driven as far below the water line as is feasible. By drawing water from the much larger surface of a tunnel than that afforded by a deep well and by skimming the water from the surface instead of drawing from the bottom of the fresh water lens far more protection against salt encroachment is afforded. Hawaii provides probably the best example of fresh water floating on salt water in accordance with the theory of the Gyben-Herzberg floating lens. The various artesian areas within the city, each with its own water level, are divided by the compact valley fills extending considerably below sea level. Hence, contrary to the usual practice in ground water developments, the developer tries to get the water under the rock ridges between the valleys instead of in the valleys' bottoms. Recharging works are now being studied by which it is proposed to divert water from streams into horizontal infiltration tunnels dug into the porous lava. The water would then filter into the artesian basins and would be picked up lower down by the wells and other artesian water developments.

World War II greatly increased the population of the islands and its termination released the large, pent-up demands of private industry and local government for expansion of industry, housing, highways, airports, water supply, sewage works, utilities, schools, hotels, apartments and other improvements. An indication of the extent of this expansion in a community of under 500,000 population can be gained from the expenditures made from 1946 to 1953. Private industry and housing expenditures were about $425,000,000; Territorial and County Highways $68,000,000; Territorial and County Sewers, Water Supply, Public Buildings and other Public Works $65,000,000; Schools, Hospitals and other Public Institutions $27,000,000 or a total of about $74,000,000 per year. This does not include expenditures made for purely Federal projects. Local government authorization for projects now in progress or to be started are approximately $75,000,000.

A further indication of the expansion of facilities in the Territory can be gained from the fact that from 1933 to 1953 telephones have increased from 22,337 to 125,077 or one to each 3.8 persons. Electric power consumption in Honolulu has risen from 98,000,000 K.W.H. to 703,000,000 K.W.H. while auto registration in Honolulu has risen from 31,000 to 123,000 in the same period.

While the features of each of the postwar categories of construction would present an interesting story only a few can be related here due to lack of space. One outstanding example is the expansion being experienced by the tourist industry, the Territory's third largest industry. Hawaii, being the crossroads of the Pacific for both ships and airlines, presents ideal facilities for a stopover by world tourists as well as a vacation land for the tourist interested in a leisurely summer vacation at any time of the year. In Honolulu the average temperature of 72 in January is only 6 degrees lower than the average temperature in mid-summer. Practically all inter-island passenger travel since 1942 has been by air. All major islands are served by one or more modern airports. Hotel construction will continue for several years at least in its endeavor to catch up with the tourist demand for space. At Waikiki Beach the most thorough and extensive sub-surface investigations fail to reveal the true nature of the foundation conditions that will be encountered. One recently completed reinforced concrete hotel, planned to be on a pile

(*Continued on page* 34)

Hakalau Bridge, above, on the Hamakua Coast route of the Island of Hawaii utilizes an old single track railroad trestle in its entirety. The trestle remained in place to form the center of the highway span over Hakalau gulch. The contractor erected an additional row of columns on each side to bring the span to highway width. Hakalau Bridge is 772 feet long and 190 feet high.

About the Author . . .

Mr. Hull

William J. Hull, president of the Engineering Association of Hawaii, is a native of New Jersey and holds a B.S. in Civil Engineering from the Virginia Military Institute and a C.E. from Cornell University.

He worked with the Metropolitan Water Bureau of Hartford, Conn., prior to 1935 when he went to Honolulu to accept a position with the Board of Water Supply there. A registered engineer in the Territory of Hawaii, since 1942 Mr. Hull has been a staff consultant for Castle & Cooke, Ltd., and he also practices privately in the field of water development and appraisals.

He is active in a number of technical associations, including the ASCE, the ASME, and the American Waterworks' Association. He is also a member of the Honolulu Chamber of Commerce, the Hawaiian Sugar Planters' Association, and the Hawaiian Sugar Technologists.

A Symposium of the Comments of Leading Engineers

On Tomorrow's Challenge to the New Members of the Profession

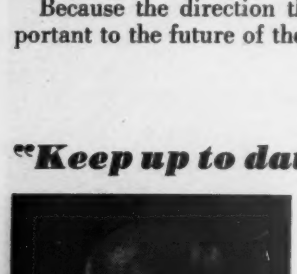
If I Were A Young Engineer Today

THIS is the time of year when the engineering profession is opening its ranks to the many young men who have just completed their formal engineering training.

Because the direction their careers will take is so important to the future of the country and the world, as well as to them personally, the AMERICAN ENGINEER has asked a number of outstanding leaders in various branches of the profession to contribute their advice and counsel for these newest engineers.

Here is what they have to say.—

"Keep up to date . . ."



Dr. Gustav Egloff
Director of Research
Universal Oil Products Company
Des Plaines, Ill.

I WOULD investigate the various industries as to their progressiveness, inventiveness, and their breadth in our economy, and then select the one that rates highest. I should acquire a thorough background in that section of an organization where new ideas and inventions are worked out. I should like to contribute many inventions to the field of my choice and through my experience become the top authority in the field. No lesser goal should satisfy any engineer.

To keep up to date in one's field, one should study and know what is going on in this field and endeavor to bring improvements therein. One should both keep abreast of current published information and maintain active contacts with high caliber men in the various engineering fields. One must take advantage of every opportunity to learn more about his job and the company for which he is working. One should always give a little more to each task than is expected.

The ability to communicate one's thoughts clearly and logically is basic to advancement. It is highly desirable to study communications and have command of the spoken and written word, to develop one's personality so that one can mix with people, to get along with people, but to know when to be stubborn.

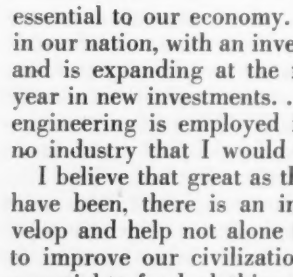
Join the various professional societies, attend their meetings and be active in them. Study their publications and the U. S. and foreign patents pertaining to one's field. Meet brother engineers at the various meetings and discuss some of your problems with them.

I know of no other field in engineering that lends itself as well to the exercise of all the faculties that one may have as the oil industry. It is progressive, imaginative, continually expanding, and produces products that are essential to our economy. It is the third largest industry in our nation, with an investment of over 50 billion dollars and is expanding at the rate of over 4 billion dollars a year in new investments. . . . Every branch of science and engineering is employed in the oil industry. I know of no industry that I would change for oil.

I believe that great as the engineering accomplishments have been, there is an incalculable future that will develop and help not alone to increase our wealth but also to improve our civilization vastly. The engineer is now essential to food, clothing, shelter, and transportation. He contributes measurably to those improvements which promise a longer life span with ample food supplies and comforts. The field for engineers is unlimited.

►

"Opportunities lie ahead . . ."

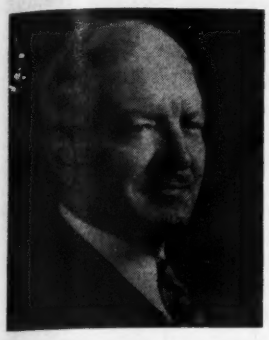


Charles F. Kettering
Research Consultant
General Motors Corp.
Detroit, Michigan

THE most successful engineer tomorrow will be the one who can intelligently apply formulas and calculate things that can be calculated, yet is able to recognize that intelligent experimentation is the only way to solve certain problems. He doesn't have to belong exclusively to a mathematical or an experimental group—he should be adept at using either tool. . . .

There are things he will encounter which neither I nor any other person can predict. They are the thousands of opportunities that lie ahead—the thousands of things that need to be done to fulfill the needs and desires of our rapidly growing nation. And when he travels along that road of tomorrow, he should keep his eye on the road up there ahead, not on the rear view mirror, because we should all be concerned with the future since that's where we are going to spend the rest of our lives.

"Set a definite objective . . ."



Willard F. Rockwell
Chairman of the Board
Rockwell Manufacturing Co., Pittsburgh, Pa.

THE young engineer leaving school to seek work never had greater assurance that his talents are in demand in the business world. If he has a choice of several positions, he will be wise in making his decision if he puts more weight on the opportunities for experience and advancement, and less weight on salary, title, or other perquisites. The young engineer who has had four years of engineering study should be able to appraise and analyze his own talents, and then seek work in that line of engineering or business activity which is best suited to his own combination of desires and natural abilities.

When we recall that more than fifty per cent of our American workmen are employed in the manufacture of goods or the production of services which were either unknown or unobtainable fifty years ago, the possibilities in the future seem beyond human comprehension. With the expansion of all fields of scientific knowledge, there are new opportunities for engineering specialists, both in industrial employment and in consulting work. With the birth of new industries developed through the practical application of scientific discoveries, the engineer has the opportunity to start in the engineering department and constantly extend his study and knowledge of manufacturing, accounting, and business practices until he can take his place in top management. It is best to set a course with a definite objective, even though unforeseeable events may change the destination, for better or for worse.

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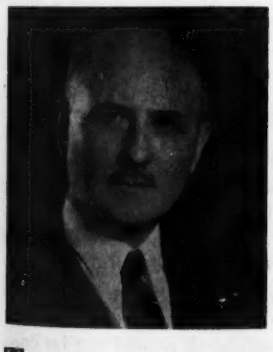
"Never stop studying . . ."



Ole Singstad
Consulting Engineer
Singstad & Baillie
New York, N. Y.

THE young engineer should endeavor to obtain during his early years a well rounded experience both in design and construction work. It is not necessary, nor even desirable, that the first job he works at will be in the precise field of his life work. Circumstances which he cannot foresee nor control, such as the ups and downs of the business cycle, may play a part in what he will do or where he will start working.

His ultimate goal should be set high if he has the ability, the education, the character, the determination to work hard and faithfully and the personality required to get to the top. There will not, however, be room at the top for every one, and there are bound to be disillusionments as well as rewards.

Advanced study is essential in engineering today with its ever increasing complexity. Those young men who know precisely what specialty they want to pursue, would of course benefit from an advanced college course in that particular specialty, provided they have the time and the money required. The young engineer can, however, learn much by reading up-to-date technical literature and taking part in engineering societies' activities and discussions. He must never stop studying.

The best way to insure advancement is to do his present job so well that he is always prepared to step into a job with greater responsibilities and compensation. These opportunities often come suddenly and the man who is prepared will probably get the job.

The engineer will continue to play an increasingly important part in our technological civilization. A young man should not choose civil engineering if his inclination and abilities are tending toward some other branch of engineering and he should not choose engineering at all as his life work unless he has the qualities, inclination and aptitude for such a career.

►

"Train, study, and watch . . ."

Hon. Joseph P. Lawlor
Mayor, Ames, Iowa,
and President, General Filter Company

THE question has been asked, "If you were a young engineer, what sort of job would you look for today?" I would look for the same type of job I sought and found upon graduation—a job that included a combination of engineering, business training and sales work. While attending college, I pursued electives that related to business, while majoring in civil engineering. I liked both subjects. After graduation, my business training was augmented by correspondence school courses.

It is fortunate for all of us that some like a highly specialized branch of professional engineering while others prefer some other type. I preferred to take part in bringing the professional engineer's accomplishments into demand of the buying public, which is the task of the sales engineer.

The question has also been asked, "If you were a young engineer, what type of experience would you work to obtain?" I would prefer traveling, sales work, meeting the public; in other words, a training in business. But each young engineer should seek experience in the type of work for which he is especially adapted. The ultimate goal that I personally would work to obtain would be to run my own business, a business that combined professional engineering, construction and sales.

The general course of action I would follow to insure

advancement would be to work at least 50 hours a week at my regular job and about 10 hours a week on improving my knowledge of engineering and business. I would again follow the profession I selected 35 years ago. There are always opportunities in this country for those who train, study, and watch.

Engineering will continue to be a rewarding career in the future, and so will other professions. Someone has said, "The future belongs to those who plan for it." The engineering profession is now the world's largest and at this time there seems to be no limit to its future size and greatness.

►

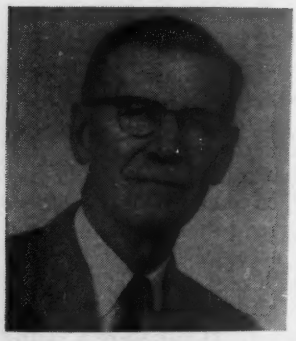
"Assume leadership . . ."

Major General
Samuel D. Sturgis, Jr.
Chief of Engineers,
U. S. Army
Washington, D. C.

IF I had to select one principle which would serve above all others as a guide to young engineers, I would say always seek out the jobs which give the greatest opportunity for operational responsibility. Although office work in a staff advisory or consulting capacity can be attractive, as can specialization in a single field, any young engineer who pursues such a course from the start of his career is taking the easy way out from running the full gamut of responsibility. Ever-changing problems of varying scope and complexity may not be much fun at times, but they are what goes to make up life. And the wider his experience in the solution of such problems, the more able the engineer is to stand on his own and to assume leadership in his profession, in his country, and in the service of all mankind.

►

"Render service to the people . . ."



R. H. Driftmier
Chairman, Division of
Agricultural
Engineering
University of Georgia
Athens, Ga.

WE are living in an amazing age. The certainty of change means everything to the young engineer of today. Change provides opportunities. Our success in making the most of these opportunities will depend upon our willingness and our ability to accept the responsibilities inherent in new opportunities. The engineering training we receive at our alma mater is not the end point—it is merely the foundation upon which our future learning is based. Education cannot be standardized. It, too, is constantly changing, so we must continue our own education through reading, observation and participation, and our reading should not be limited to our own field of specialization.

Every one, I'm sure, would like to be thought of as being a success. Success in life isn't the result of wishful thinking. To achieve success in life one must have a purpose, back of the purpose there must be a principle, and back of that, faith—faith in yourself, in your fellowman, and in God. Real ability, real understanding, and real leadership are recognized and known by their fruits. As individuals we can accomplish very little—our success and advancement and satisfaction are largely dependent upon our ability to cooperate with others. I like to think of cooperation as the art of adjusting and conducting myself so that I can work with others and they can work with me. That places the responsibility for team work on my shoulders—exactly where it belongs.

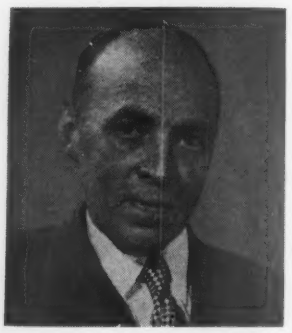
The engineering profession is an honorable one—take pride in it. Believe in it and practice integrity and fair dealing, tolerance and respect, devotion to the standards, ideals and dignity of the profession. Let us show our pride and loyalty by becoming affiliated with our professional society. Such affiliation will pay tremendous dividends to us as individuals, but more important are the contributions we as an integrated group can make to the social and economic well-being of the world in which we live.

We are sometimes asked whether, if we had our lives to live over, we would follow the same course or profession. That is an individual question that each man must answer. In my own case I would. The engineering problems in agriculture are manifold and complex. If I can render a service to the people of my State and through it to our country then I shall be happy and feel that however insignificant my contribution may have been, at least, I will have helped.

This, I believe, should be the attitude of the young engineer in every branch of the profession.

►

"Obtain general experience . . ."



Hon. Frederick H.
Zurmuhlen
Commissioner of
Public Works
New York, N. Y.

MY advice to the young man starting out in the engineering profession is: Be a general practitioner.

We need more general practitioners in engineering, men having the ability to ask the right questions, the know-how of leadership and executive ability, and the knack of integrating the efforts of others. With this as my goal, I would seek to obtain general experience in engineering —in design, in the field, in the office. I would not be concerned about advanced study until my experience and interests led me to it. There is always room for advancement for the kind of general practitioner I have described.

Engineering will continue to be a rewarding career, for it is one of the professions essential to meeting the needs of our growing population, helping the development of other economies and safeguarding the future of our country and the world.—*End.*

By
Milton F. Lunch,
N.S.P.E.'s Legislative Analyst

CONGRESSIONAL ACTION ON EDUCATION

Three items of pending legislation which have cleared the House and Senate pertain to the general national problem of education at all levels.

For the engineering profession, the various aspects of the many educational problems are obvious in some cases, but it is now becoming apparent that the profession has a stake, too, in secondary and high school educational policies and limitations. In the May, 1954, issue of the AMERICAN ENGINEER, for example, Major General Samuel D. Sturgis, Jr., Chief, U. S. Army Corps of Engineers, commented on the fact of relatively low enrollment in the high schools in the subjects of algebra, geometry, trigonometry, chemistry and physics. Others have commented on the serious problem of recruiting and retaining qualified science teachers for the high schools. Still others have deplored the lack of basic educational qualifications which show up when high school graduates apply for or actually enter engineering colleges.

At the recent Milwaukee Annual Meeting, the NSPE Board received a resolution from the New York State Society of Professional Engineers declaring that the expanded scope and complexity of modern engineering has increased the amount of knowledge and training required of engineering graduates, and noting that the education of engineering students in college is hampered by the lack of adequate preparation in mathematics. The resolution, calling for NSPE study of means to improve the teaching of mathematics in secondary schools, was referred to the Education Committee for study and recommendations.

With this partial background it is worth noting what steps Congress is taking to deal with the general educational problems. First is a bill to establish a National Advisory Committee on Education, composed of nine outstanding lay and professional persons. The Committee would meet not less than three times a year and appraise significant problems in the field of education, decide which problems seem to be capable of practical solution, set priorities as to the immediacy with which each should be attacked, and consider how such study and action should be organized. The Senate Committee, in reporting the bill, added the provision for the inclusion of professional persons on the body, noting the primary responsibility of lay citizens for educational matters. However, it was felt that a better balance and a more effective group would result by including some professionals.

The second legislative proposal involves the authorization of a cooperative research program in education. Under the bill, the Commissioner of Education would be authorized to enter into contracts or jointly financed cooperative arrangements with public and other nonprofit universities and colleges and state educational agencies for the conduct of research, surveys, and demonstrations in the field of education. The Commissioner would be required to obtain the advice and recommendations of educational research specialists and submit periodic reports to Congress. In justifying the authorization and the contemplated expenditure of some $100,000 for the first year of the program, the Committee observed that the prime advantage of cooperative research work is that such procedure makes full use of existing facilities and avoids the centralization of staff and facilities in Washington. "The same procedure has been followed in the field of public health . . . and has resulted in notable improvements and great returns for each Federal dollar spent," the Committee report stated.

Shortages in Professions

In giving examples of the type of research which might be undertaken, the Committee listed: "Attracting more young people into teaching, engineering, and other 'shortage' professions." Other

(Please turn the page)

cited examples are: reducing the cost of educational facilities, improving business procedures in schools and colleges, improving teaching methods, placing community health and social agencies in proper perspective with school programs.

Finally, it is proposed that a so-called White House Conference on Education be called to consider and report to the President on significant and pressing problems in the educational field. The contemplated procedure and schedule is to bring state groups together first for the purpose of making recommendations for appropriate action to be taken at the local, state and Federal levels. Federal funds in the amount of $1,500,000 would be allotted to the states to help finance the state conferences. The state meetings would be held in late 1954 or early 1955.

Following the state conferences, representatives of all the states would be brought together in Washington, not later than November 30, 1955, to consider the state conference viewpoints and attempt to develop a national policy. The Senate Committee report emphasizes the delicate point that the conditions underlying existing educational problems vary greatly from community to community and from state to state, and, accordingly, that differing approaches to the problem in different areas quite properly should be considered in seeking a solution. "For this reason it is all the more compelling that the initiative in solving educational problems be fully exercised at the local and state levels," the report declares.

Federal Financial Aid Deferred

It may be observed that this three-step legislative program, which is backed by the Administration, does not include the more controversial and more expensive proposal of long standing that the Federal government should provide financial assistance for school operation. The Administration has decided to put this item off until after the projected White House conference has been held. It has been argued that the above-described steps are "too little and too late," and that only direct financial aid in substantial amount can save the situation. The history of attempts to provide Federal financial assistance is replete with sometimes bitter controversy and the Administration is not prepared to renew the argument at this time, preferring to await the recommendations of the conference as backing, if it develops. Next year may witness a new concerted drive to obtain the Federal financial aid program.

INDUSTRIAL DEVELOPMENT OF NUCLEAR POWER

The Joint Congressional Committee on Atomic Energy is expected to report a bill soon which will open wider doors to industry and give greater opportunity for the industrial development of atomic power for peaceful purposes.

Perhaps the most significant statement presented to the hearing body was that of the Atomic Energy Commission which covered two "essential" factors:

1. That nuclear power is not yet an economic reality in the competitive cost sense, and
2. That the big job of driving costs down to levels competitive with conventional electric energy can best be accomplished by joint effort of both industry and government as a working team.

Neither of the two points are new or sensational, but they do put into a few words what may be considered the Administration's position in a field not devoid of disagreement. The AEC states that only a small number of full-scale privately-owned and operated power reactors are likely to be on the line before 1965. "Faster introduction may be possible, but without extraordinary measures of Government assistance, which we are not recommending, this time scale seems reasonable on economic grounds."

The Commission does not fear any serious economic dislocations as atomic power moves into the area now occupied by conventional power. "The gradual integration of nuclear power into the nation's electric generating industry is not likely to be accompanied by significant dislocations," the Commission statement added. "Even with nuclear power, consumption of coal for generating electricity is expected to triple by 1975, and demands on coal and on oil and natural gas in other industries and domestic uses will far outweigh any share of their market met by nuclear power."

The atomic agency expressed its confidence that the required high degree of Federal participation would not conflict with the necessary freedom of initiative to private power producers, and that "the special problems of atomic energy can, without risk to security or safety and without unfair advantage to any group, be reconciled with the proper roles of industry and Government as conceived in this country."

The accumulated scientific and technical knowledge, as well as the accumulated stockpile of fissionable materials, are a national resource, it was stated. "Putting this resource to work, through continued Government development where necessary, and through private industry, to strengthen the economy—to create power for industry and homes, open up jobs, create new sources of revenue—will most quickly and surely achieve and spread its benefits."

Annual Meeting Highlights

Engineers Conclude Outstanding Conference

"The most outstanding professional meeting to date" was the verdict repeated time and again as those who attended the Twentieth Annual Meeting of the National Society of Professional Engineers in Milwaukee left for their homes at its conclusion. Acting as hosts for the occasion and contributing in large part to its success were the members of the Wisconsin Society, who held their board of directors meeting in conjunction with the national conference.

Registration began at Milwaukee's Schroeder Hotel on June 9, the date of a day-long meeting of NSPE's Executive Committee, and the national meeting proper filled the three succeeding days with a series of business, professional, and social events at which a new record of attendance was set. Every past president of the National Society since 1948 was present at the meeting, including Alex Van Praag, Jr., A. C. Stanford, S. L. Stolte, L. L. Dresser, and John D. Coleman.

Outgoing President T. Carr Forrest, Jr., presided over the professional sessions at which the various officers' and committees' reports were received and discussed prior to official action by the Board of Directors.

Highlight of the meeting, of course, was the installation of new officers for the coming year, headed by Clarence T. Shoch of Allentown, Pa., 1953-54 Northeastern Area vice president, as the new national president. In addition to Mr. Shoch, those installed included the following vice presidents: Louis F. Frazza, Hawthorne, N. J.—Northeastern Area; M. F. Wooten, Jr., Charlotte, N. C.—Southeastern Area; R. J. Rhinehart, Pine Bluff, Ark.—Southwestern Area; Virgil E. Gunlock, Chicago, Ill.—Central Area; John B. Jardine, Fargo, N. D.—North Central Area; and Orland C. Mayer, Boise, Idaho—Western Area. In addition, Paul H. Robbins of Washington, D. C., and Russell B. Allen of College Park, Md., were again installed as executive director and treasurer respectively.

The annual banquet, at which the installation took place on Saturday, June 12, at the Milwaukee Elks Club, also afforded the occasion for the presentation of the 1954 NSPE Award to Harry A. Winne, recently-retired vice president of the General Electric Company, Schenectady, N. Y.

In his acceptance speech entitled, *Some Thoughts on Engineers and the Engineering Profession*, Mr. Winne discussed the qualities that are inherent in the professional man, including a continual striving for increased knowledge in his field, a spirit of service, individuality, and a high standard of ethics.

In turning to the question of unionism, he expressed his firm conviction that unionization of the professional man is in direct philosophical conflict with the motivation that should govern him, particularly since the professional man owes a responsibility and a loyalty to the general public that cannot be subordinated to union regulation and activity.

"I cannot," said Mr. Winne, "conceive how a man who joins a labor union can also think of himself as a professional person. When he joins a union he delegates to the union leaders the right to bargain with his employers as to his remuneration and other working conditions. They quite likely will formulate rules covering the rate at which he can advance from step to step. He usually agrees to strike at the call of the union leadership. We have recently witnessed strikes of engineers against companies engaged in vital defense work. Do you suppose the public thinks of those striking engineers as professional people, regardless of what they may call themselves? How can it, with its understanding that inherent in any

Engineers' Creed

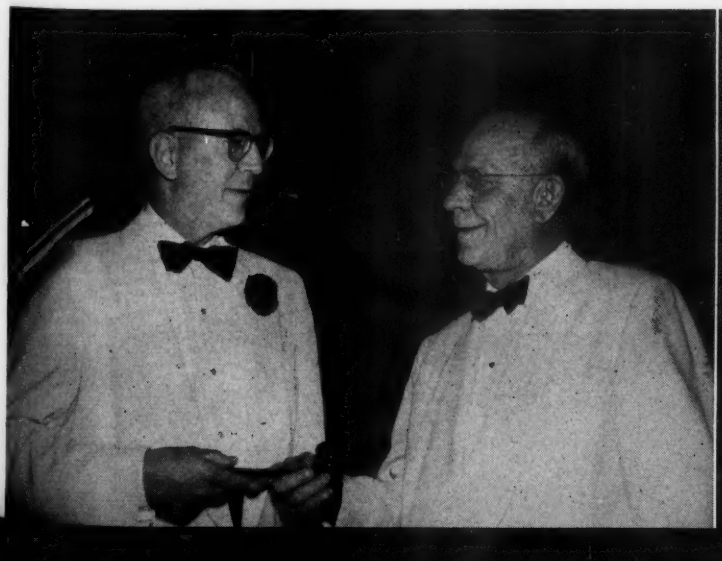
Adopted by NSPE's Board of Directors, June 1954

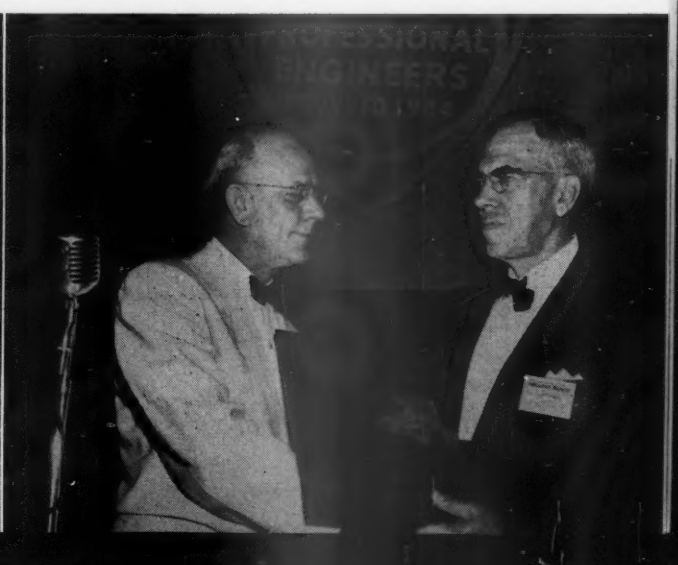
As a professional engineer, I dedicate my professional knowledge and skill
To the advancement and betterment of human welfare.

I pledge:
To give the utmost of performance,
To participate in none but honest enterprise,
To live and work according to the laws of man and the highest standards of professional conduct,
To place service before profit, the honor and standing of the profession before personal advantage, and the public welfare above all other considerations.

In humility and with need for Divine Guidance, I make this pledge.

ENGINEERS IN THE SPOTLIGHT—The picture at the left below shows NSPE's new president, Clarence T. Shoch of Allentown, Pa., accepting the official gavel from T. Carr Forrest, Jr., of Dallas, Tex., outgoing president of the National Society, during the Milwaukee meeting. In the second photo, Mr. Forrest (left) congratulates Harry A. Winne, recently-retired vice president of the General Electric Company, as the latter accepts the 1954 NSPE Award for his outstanding service to the engineering profession.





profession is the ideal of service to the public, to the national welfare?"

Also, in touching upon the question of a "unity" organization, Mr. Winne stated that the National Society of Professional Engineers seemed to him to be the best vehicle through which to achieve it. He mentioned that at one time he thought that non-registered engineers should also be admitted to Society membership, but that he has now come to believe that the registration requirement is a sound one. "I think," he declared, "that retaining these restrictions will, as time goes on, add greatly to the strength of NSPE. If its voice represents the engineers who have been registered under the laws of the various states, its voice will be listened to with respect . . ."

This latter was a sentiment that was also emphasized by President Forrest in his earlier address to the delegates when he stated that "the common denominator of a professional approach to engineering is registration." In addition, Mr. Forrest stressed the need for improved utilization of engineering talent, noting that the problem of utilization and professional recognition deserved increased attention in both industry and government; and he also urged further serious study of engineering educational activity, including the years after graduation before full professional status is gained through registration.

Mr. Forrest was also honored at the annual banquet for his service to the Society as president, and he received a watch and certificate of recognition from C. L. Emerson, chairman of the Awards Committee, as did John D. Coleman of Dayton, Ohio, who was the 1952-53 national president preceding Mr. Forrest.

Another national officer to receive special recognition during the meeting was NSPE Treasurer Russell B. Allen, professor of civil engineering at the University of Maryland. A gift of luggage was presented to Professor Allen during the Saturday luncheon in appreciation of his many years of professional service and leadership, both in the Maryland SPE and NSPE.

Guest speaker at the luncheon was Henry J. Taylor, well-known news commentator, who discussed *Engineering Responsibilities in an Unsettled World*. Other prominent speakers who addressed the delegates during the course of the meeting included The Hon. Frank P. Zeidler, Mayor of Milwaukee, who delivered a welcoming speech on June 10, and Dr. Frank D. Slutz, educator and counselor, whose theme was *The Reach of Engineering*.

The latter address was delivered at the Friday luncheon which was given in honor of the Engineering Division of the Wisconsin Registration Board of Architects and Professional Engineers and the officers of the Wisconsin SPE. Wisconsin President Pierce G. Ellis, presided at the luncheon. The honored Registration Board members were: Chairman Kurt F. Wendt, Secretary Wilmer A. Piper, and William E. Crawford, Robert C. Johnson, Charles A. Halbert, and Delmar W. Nelson. In addition to President Ellis, the Wisconsin SPE officers honored were: George P. Steinmetz, first vice president; Albert O. Ayres, second vice president; Eldon C. Wagner, secretary; Lloyd M. Schindler, treasurer; Richard C. Clark, past president; Marcus A. Blakey, Lester O. Hoganson, William F. Baumgartner, Anthony L. Genisot, and Herbert O. Lord, state directors; and Arthur G. Behling and Edwin J. Kallevang, national directors.

The Regional Luncheons, scheduled for Thursday, June 10, and presided over by the various vice presidents of the Society constituted another important feature of the program, as did the annual meeting of the Professional Engineers Conference Board for Industry, which was held on June 11.

A Saturday morning panel discussion on the subject, *Evaluation of Engineering Education*, attracted a large and interested audience. Willis R. Woolrich, dean of engineering at the University of Texas, acted as moderator. Those taking part in the panel included: George F. Branigan, dean of engineering, University of Arkansas; N. W. Dougherty, dean of engineering, University of Tennessee, and outgoing NSPE vice president; Maynard M. Boring, manager of technical personnel development, General Electric Company; and John Gammell, director of graduate training, Allis-Chalmers Manufacturing Company.

One item that evoked considerable interest was the announcement that, in the unofficial "membership contest" among the Ohio, New York, and Pennsylvania Societies, first place had gone to New York as the Society having the greatest membership gain in the past year. Pennsylvania ranked second, and Ohio came in third.

Other features of the program included tours of local industrial facilities during the day on Friday and an entertaining social event — "A Milwaukee Gemutlichkeit Evening" on Thursday, June 10.

Local clergymen who gave the invocations at the several banquets were: Rabbi Herbert A. Friedman, Congregation Emanu-El B'ne Jeshurun; Rev. C. J. Ryan, S.J., vice president in charge of development, Marquette University; and Rev. R. J. Lillie, pastor of the Cross Evangelical Lutheran Church.

A special program, which included a general NSPE Auxiliary Meeting, and various social events was arranged for the ladies who attended.

(*Continued on page* 36)

AMONG THE CONFEREES—In the photo at the left below, incoming NSPE President Clarence T. Shoch (center) studies some plans for the coming year with other 1954-55 officers. In the foreground, l. to r., are Vice Presidents Louis F. Frazza and R. J. Rhinehart. Looking over their shoulders, l. to r., are Vice Presidents Virgil E. Gunlock, M. F. Wooten, Jr., and Orland C. Mayer, and Treasurer Russell B. Allen, Vice President John B. Jardine was not present for the photo. The second photo shows, l. to r., outgoing President T. Carr Forrest, Jr., Treasurer Russell B. Allen, and NSPE Executive Director Paul H. Robbins, as the latter prepares to present a gift of luggage to Professor Allen from the Society.

An *American Engineer* SPECIAL REPORT

Re: Industrial Defense in the Atomic Age

● Continuity of management, continuity of essential production, and preservation of technological "know-how" are the main objectives to be considered in planning the industrial defense of the Nation in this age when atomic warfare is an unhappy possibility, according to Government and industrial leaders who have been studying the problem in detail.

As this issue of the AMERICAN ENGINEER goes to press, a conference on "Industrial Defense in the Atomic Age," sponsored by the U. S. Chamber of Commerce, has just been concluded in Washington, D. C. What to do if H-bomb warfare is ever aimed at the country's essential industries, such as the aircraft manufacturing plant pictured on this page, and how to make effective advance preparations for such an eventuality, came in for thorough discussion as the above-mentioned defense goals were spotlighted and emphasized as items of major concern by speaker after speaker.

Of particular interest was the address given before the conferees by Charles F. Honeywell, the administrator of the Commerce Department's Business and Defense Services Administration. "The physical protection of facilities is the cornerstone of industrial defense," said Mr. Honeywell, noting that this protection also includes measures to defeat sabotage as well as to fend off or minimize blows from the air.

Advance planning for all such contingencies is of the essence, according to the BDSA administrator who emphasized that "there can be no real continuity of production without the continuity of management." The microfilming of important corporate records, establishing safe storage facilities away from target areas, establishing alternate command posts in the event the company headquarters is knocked out, setting the lines of executive succession and establishing cadres of key administrative and technical personnel were among the steps recommended by Mr. Honeywell for the preservation of "the managerial sequence and corporate identity required to rebound from an attack."

As to the question of industrial dispersal, for the greater protection of production facilities, he stated that no company can reasonably be expected to make unusual expenditures that would jeopardize its financial structure or injure its competitive status to bring this about. "It would not be an easy thing to alter completely the industrial face of America," he said. But he added the caution that "we must face up to the disquieting fact that a new ingredient has been added to the formula for locating defense-producing facilities in this, The Atomic Age. That new ingredient is the 'economics of survival.' "

Speaking of the Government's role in the industrial defense picture, Mr. Honeywell defined it as the responsibility "to set broad policies for the defense of industry, to provide incentives, where needed, and to assist and advise management, where possible." Individual company managements, however, must initiate and carry out many, if not most, of the things which must be done in the defense planning, he added.

"I think it is safe to say," he declared, "that the greater part of the job of industrial defense must be done by the owners and managers of the Nation's industrial facilities. While there must be state and national coordination, we have an idea that a thousand good company plans are to be preferred to a single master plan superimposed by Governmental authority. In short, the responsibility rests with you—the owners and managers of the industrial facilities of America."

The Business and Defense Services Administration, he continued, "would like to see every important defense company, on a voluntary basis, prepare an over-all company plan for the protection of

(Please turn the page)

its facilities, the continuity of its management and the continuity of its operations. Such a document would be reassuring to the employees, the stockholders, the customers, and the Government."

A particularly important responsibility assigned to BDSA, Mr. Honeywell also pointed out, is to perform staff services for the Industry Evaluation Board. This is the inter-agency board, composed of representatives of the Office of Defense Mobilization, the Atomic Energy Commission, the Federal Civil Defense Administration, and the Defense, Interior, and Commerce Departments, and established by a presidential executive order, which has been assigned the job of identifying the products and various facilities which are of the highest priority defense-wise. "We must make doubly sure that all the facilities on the Critical Industrial Facilities List are adequately protected," he said.

He further commended various industry-wide "task groups," such as those of the chemical, communications, domestic jewelled watch, and iron and steel industries, for the progress they have made in analyzing their defense problems and taking the first steps to put their industrial defense preparations on a sound basis.

BDSA, he also reported, has "both the statutory authority and the administrative machinery for making thorough, comprehensive surveys of industrial defense problems, industry by industry." And he urged every important defense industry to take advantage of these facilities to develop effective policy with relation to its defense program.

Another important—and—unusual—address delivered during the conference was that of John H. Redmond, assistant production manager of The Koppers Company, Inc., of Pittsburgh. The Koppers Company has already worked out a full industrial defense program. It has selected a temporary headquarters outside of Pittsburgh as a reorganization point should that city be subjected to atomic attack. It has microfilmed important records, fixed a "chain of command" of executive personnel, and worked out procedures under which its sixty-four plants would maintain operations should the Pittsburgh headquarters be wiped out.

In his speech, Mr. Redmond detailed the background of the Koppers plan, carefully outlining all the factors that had been taken into consideration in working it out. "A peacetime disaster plan is an excellent start on a disaster plan for wartime," he said, "but a disaster plan for wartime must go further. Such a disaster plan must be based on the assumption that there will be at least partial success initially for any enemy, and as a result, rather widespread destruction, disruption, and chaos within our country and within our industrial organizations."

He did not recommend the Koppers industrial defense plan as "The Plan," pointing out that, while it fitted his company's particular needs, other firms would have their own individualized problems to face in the defense picture. He did, however, point out three important considerations in such planning that are easily applicable in every instance:

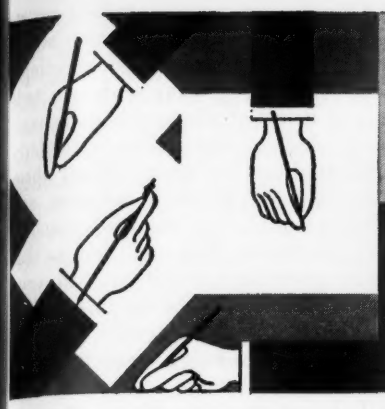
1. He suggested that an over-all plan be drawn up covering each company as a whole, and each of its plants individually, and that in that plan should be incorporated as much preparation and action as could be completed and afforded before war comes.

2. He reiterated his suggestion that such a plan can be the natural extension and broadening of currently-existing safety and security programs, taking into consideration the concept of disaster on a wide scale, rather than a localized, limited one.

3. He strongly advised that the plan for each company, and each plant, be reduced to writing so that there would be no misunderstanding and so that there would be assurance that all essential points were covered.

Others who brought the benefit of their viewpoints to the conference included: Federal Civil Defense Administrator Val Peterson, Defense Mobilizer Arthur S. Flemming, Assistant Secretary of Defense Donald A. Quarles, and Lieutenant General Willard S. Paul of the Office of Defense Mobilization.

There are two salient thoughts, however, that the conference seems to have underscored for nationwide consideration. First, there is the fact emphasized by Mr. Redmond, that when a disaster of any scope strikes "You must be able to go ahead on your own." Secondly, there is the summation of the sensible approach to the situation expressed by Mr. Honeywell as follows: "Industrial defense is a many-sided problem. It is comprised of many things — some enormously complex, others relatively simple. We must not, therefore, allow the big, seemingly insoluble issues to obscure the smaller ones. If we get on with the easier problems, the bigger ones might look a little less formidable."



Professional POSTSCRIPTS

This is your department. Your contributions to it are solicited. We want your views on subjects that affect the engineering profession directly or indirectly. Please keep your contributions short, and remember that editing may be necessary to conserve space. Your name may be omitted if you desire.—*The Editor.*

First of all, our attention has been called by several readers to the considerable amount of editorial comment in Chicago papers, expressing approval of the recent appointment of NSPE Vice President Virgil E. Gunlock as head of the Chicago Transit Authority.

NSPE has long urged public officials to utilize qualified engineers more extensively in such work and members of the engineering profession to accept public service responsibilities of this nature. The editorial from the *Chicago Tribune* of June 10, 1954, with respect to Mr. Gunlock's appointment is worth repeating here, not only because it supports a philosophy in which NSPE believes, but also—and more important—because it presents to the readers of the *Chicago Tribune* a philosophy of public service illustrative of the highest ideals of engineering. Here then is the editorial—

—PP—

—Engineers in Public Service—

Mayor Kennelly's choice of Virgil E. Gunlock for the $35,000 a year post of chairman of the Chicago transit authority will be well received. Mr. Gunlock has demonstrated executive ability in two important city jobs. The appointment is encouraging evidence that the city government is building, within its own ranks, a corps of capable administrators.

When young Virgil Gunlock, 27 years ago, packed up his engineering diploma from the University of Illinois and got a job working for the sanitary district a good many of his classmates, it may be hazarded, told him that there must be better ways of getting on in the world. And when a grand jury pointed a finger at his political bosses the following year, Mr. Gunlock's friends felt confirmed in their prejudices, no doubt.

Perhaps it will be well to point out to the engineers who will be getting their diplomas next week at Champaign and on other campuses that a young fellow who knows his stuff, can handle people, learns on the job, and keeps his nose clean can get ahead in the world just as well in a public job as on the staff of a big corporation. Government has as great a need of good engineers as has industry, and if it will give them a chance to do an honest job, it can recruit them.

—PP—

Other thoughtful words relative to engineering as a profession and engineers as professional people were uttered by AIEE President Elgin B. Robertson in an address before the annual meeting of the Texas Society of Professional Engineers, of which he is a past president. Here is what he had to say—

—PP—

Should engineers be recognized as professional people?

To answer this question, we must all have a common understanding as to what we mean by "profession." If we have a clear idea as to what we mean by "profession," then I believe we can determine for ourselves the answer to this question.

The dictionaries express the idea that a profession is an occupation which requires a liberal, if not specialized, education, and which involves mental effort rather than manual labor; that a profession implies scholarship, as in the case of the three learned professions of law, medicine, and theology.

The very fact that law, medicine, and theology are usually cited as examples of what a profession is would suggest that service to society or ministry to the people are important characteristics of a profession.

Wiser men than I have attempted to define the characteristics of a profession. Let's look at a small part of what has been written on this subject.

In his "Second Mile," Dr. Wickenden starts off by saying:

"Every calling has its mile of compulsion, its round of tasks and duties, its code of man-to-man relations, which one must traverse day by day if he is to survive. Beyond that lies the mile of voluntary effort, where men strive for special excellence, seek self-expression more than material gain, and give that unrequited margin of service to the common good which alone can invest work with a wide and enduring significance. The best fun of life and most of its durable satisfactions lie in this second mile, and it is only here that a calling can attain to the dignity and distinction of a profession."

One other reference I like is that by Dr. Vannevar Bush, in his "Qualities of a Profession":

"In every one of the professional groups will be found the initial central theme intact—they minister to the people. Otherwise they no longer endure as professional groups.

". . . Ministry carries with it the ideas of dignity and authority; it connotes no weakness, and offers no apology. . . . There is no fog of subservience surrounding the concept. The physician who ministers to his client takes charge, by right of superior specialized knowledge, of a highly personal aspect of the affairs of the individual. The attorney assumes professional responsibility for guiding the legal acts of his client, and speaks with the whole authority of the statutes as a background. It is in this higher sense that we trace the thread of ministry to the people.

"This is the fuel which has kept alight through many ages the professional spirit. Every time that the fuel has become exhausted, the light has gone out. It has not mattered how much was retained of trapping and mysticism, nor what the profundity of utterances, there has been no true profession that has not with dignity and authority advised and counseled the people, that has not guarded the commonweal. For a true profession exists only as the people allow it to maintain its prerogatives by reason of confidence in its integrity and belief in its general beneficence."

I will not attempt to add my own definition, for what has been expressed here is what a profession means to me. If we can accept this concept of a profession, let's see how we measure up.

A profession requires that its practitioners be educated. Engineers receive an education quite a deal more on the technical side than on the liberal side, and usually of a shorter

number of years than those in the learned professions. Some of us feel that more time should be spent in school, so that a broader based line of study could be followed. Others feel (and perhaps they are somewhat short-sighted) that four years is enough. There is not too much that can be done about this as long as such attractive offers continue to be made to the four-year men. Perhaps we need more education in order to be able to effectively take part in those things affecting public welfare and on which engineers are particularly qualified to speak. Maybe we need courses in public speaking, psychology, history, economics, etc.

A profession requires mental effort rather than manual labor. We engineers, without question, do our work with our heads rather than with our hands. The decisions we are called upon to make have as far reaching consequences as those of the recognized professions. We do labor under a handicap, in that only a few of us come into direct contact with the people who use our products or services. Let's recognize this handicap, and apply our best effort to telling the story of the accomplishments of the engineer. If we can do this effectively, we might even be recognized as members of a learned profession.

A profession implies scholarship. There are by far a greater number of scholars in our ranks than we ourselves realize. Our laboratories and business organizations are filled with scholarly, able individuals, but it will be hard to get public recognition for these men, for so many are associated with industry, and the public comes into contact with a product, rather than a service.

A profession ministers to the people. We engineers have done more to raise the standard of living of the people than all others combined. Here again, we labor under the handicap of producing products rather than services. The part played by the engineer is a fascinating story. We literally have our fingers in the food that people eat, the water they drink, the air they breathe, and the clothes they wear. We have brought this country of ours comforts that are beyond the wildest dreams of our forefathers. Why, then, is not our part fully recognized?

From the previous discussion it will be seen that engineering has the earmarks of a profession—it might even attain to the position of a learned profession—but whether we are ever recognized as such by the public depends entirely on you and me. We will have to apply ourselves to overcome the handicaps I have mentioned, and above all, we will have to look and act as the people expect professional people to look and act.

I am afraid that we have depended too much on organization to do for us that which we want done, and too little upon our own personal effort. Registration has not and will not create a profession. Neither will TSPE and NSPE create a profession. A profession is the product of individuals. The engineering profession, if we have one that is recognized as such, will be the end product of you and your own efforts. We must conduct ourselves in such a way that we will deserve to be held in estimation as we wish to be esteemed.

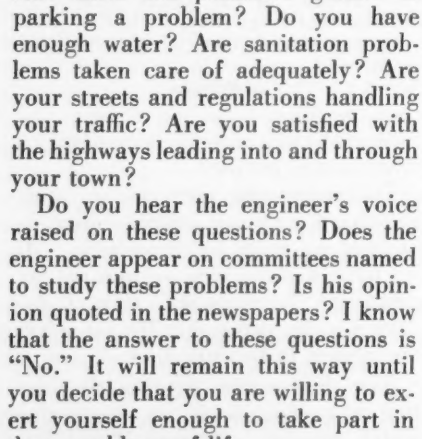
All this will not be done without a great deal of effort being put forth by each of us. I think that effort is very much worthwhile.

Perhaps some of you are willing to do your part, but do not feel that you have an opportunity of doing anything. I do not agree with this, for there is opportunity for all of us. Perhaps a suggestion is in order.

Do your neighbors know what you do and how your work affects them? Do the other people with whom you come in contact, outside your business, know the part we engineers have had in America's advancement? Be a missionary every day.

In your own community, I know that there are problems galore. Is parking a problem? Do you have enough water? Are sanitation problems taken care of adequately? Are your streets and regulations handling your traffic? Are you satisfied with the highways leading into and through your town?

Do you hear the engineer's voice raised on these questions? Does the engineer appear on committees named to study these problems? Is his opinion quoted in the newspapers? I know that the answer to these questions is "No." It will remain this way until you decide that you are willing to exert yourself enough to take part in these problems of life.



Missouri Society of Professional Engineers—Annual Meeting. October 22, 23. Statler Hotel, St. Louis, Missouri.

Our chapter meetings reflect our attitude, and too often are simply an extension of our technical meetings. Why doesn't your chapter devote itself to one or all of the problems in your town which engineers are particularly well qualified to solve? Study them diligently, debate their solution, and when a conclusion has been reached, let it be known. You can't tell me that your newspaper won't publish your findings. If you will do this, before you know it you and your Society will find yourselves being consulted on all sorts of community problems. This will bring the recognition that you want.

On the other hand, devote yourself entirely to the job that provides your livelihood, refuse to exert yourself on behalf of your fellow man, and the answer to the question I asked at the very beginning is bound to be "No."

I hope that I have done a little here to provoke you into thinking about this problem. I believe that is all that is needed. Engineers have solved a lot of problems more difficult than this.

People are known by the company they keep. Please do not forget that what you do and do not do affects me and all your fellow engineers. Do and act as you want me to do and act. Pull your own oar fully, and look mankind straight in the eye.

—PP—

Another striking commentary on the responsibilities and the dignity of the engineering profession has recently been called to our attention. This was the address of Pope Pius XII to the first Congress of the International Federation of National Associations of Engineers, which was held recently in Rome. Excerpts from the message follow.

—PP—

We have no hesitation, Gentlemen, in considering as an important event this first Congress of the International Federation of National Associations of Engineers, which brings you together in Rome, to discuss various questions regarding the general training of an engineer in view of his social duties. The interest of the subject itself, as well as the outstanding qualifications of your Assembly's members, give every reason to hope that your work here will have numerous repercussions. We are therefore happy to welcome you here, and to tell you how closely Our solicitude coincides with your own. . . .

More than once, your lecturers have sadly indicated the paradoxical place which seems to be assigned to your profession. In fact, the engineer occupies, without a doubt, an emi-

nent position among all those who have built up and who still elaborate the modern world. Present-day civilization is marked by an extraordinary evolution of man's means of action, his ability to observe phenomena, to manufacture tools for transforming matter, to build engines capable of conquering distances, and to establish fast and secure means of exchange between various countries. All these results are the fruit of the engineer's research, of his long painstaking calculations. In spite, however, of his very extensive contribution, the engineer becomes aware of the fact that the place granted him in the organization of society is inadequate, and that he rarely attains to positions of command. Though ever ready to collaborate in carrying out the projects of others, he can seldom assume the direction of those economic, administrative and political forces on which the progress of public institutions depends. You have pointed out several causes for this state of affairs; We shall turn Our attention to one of them, which seems to Us more significant than the rest.

It has been justly remarked how well the specific training of the engineer, based on the study of mathematics and the experimental sciences, qualifies him for the observation of concrete realities, for the evaluation of the forces and resources of nature and the possible means of utilizing them. The building of machines and instruments demands the greatest precision, both in preliminary calculations and in the making and assembling of their various elements. Even minute defects are quickly observed, and the reward of success or the punishment of failure is not long delayed. His continual practice of a profession entailing such imperative demands accustoms the engineer to be closely attached to concrete problems whose solutions must be of practical use. This is the price of technical progress; an invention becomes outmoded as soon as a cheaper, more efficient process is discovered. Thus, through constant application to the solution of practical questions, the engineer sometimes gives in to the temptation to neglect somewhat the scientific aspect of his career, and to prefer empirical procedures to real, definitive theoretical solutions. Since he is often obliged to bow to administrative and economic considerations, he runs the risk of having his intellectual view of problems shrink little by little, and of being too exclusively absorbed in a circle of immediate interests, to the detriment of higher viewpoints which are, perhaps, less immediately useful, but more universal and consequently of wider import. You are right, then, to insist on the need for a general scientific culture which will allow the engineer easily to surpass the limits of his specialization and the over-narrow conditions of his ordinary occupations, in order to interest himself in connected branches and help himself from their resources. His creative power will thus be intensely stimulated, as well as his efficiency in his own proper branch.

But one must have the courage to go even farther. If applied technique has greatly increased economic prosperity and extended true well-being to wider sectors of the population, this does not yet represent anything but partial achievement. . . .

In other words, if the engineer really aims at being a guide and an originator of social progress, it is important that, first of all, he should have well-thought-out views on human society's general aims, and on all the elements affecting its evolution. This does not mean that he should be an expert in juridical, economic and other sciences, though they may well afford him useful supplementary information; but that he must acquire a personal, sufficiently profound idea of these natural laws which govern man and rule his actions as an individual, and as a member of the various social groups, particularly of the family and of the nation. For such a purpose, it is not sufficient to consider man as he is today; but he must be explained by following his development through the ages which mark out the progress of civilization. The meaning of individual elements is better seen by envisaging them in the general scheme, into which they fit and consequently appear in their true perspective. For this indeed is the mark of true culture, which carefully distinguishes between essential and accessory, and discerns in an over-all effect the role played by each of its components. We repeat, there is no question of becoming a specialist in each of these fields, but only of keeping one's mind open to all those forms of the good and beautiful created by men's initiative and devotedness, whether of our own time or of the past, and of seeing the relations binding them together in orderly subordination. . . .

We have just now praised your efforts to fulfill your social obligations fully. Your post in the very centre of enterprises, as the link between the general managements and the workman, demands of you, not only professional aptitudes, but also a profoundly human outlook. You have to direct free intelligent persons. If you strive to keep before your eyes the vision of man as a comprehensive whole of which We have just spoken, you will have no difficulty in noting that the personal problems which affect your life and destiny, touching the most intimate depths of your mind and heart, are just as acute, though perhaps less consciously so, for the humblest of your subordinates.

You like to be entrusted with responsibility, to be left free to take initiative on your own; you wish to see the purpose which is aimed at, and to check as you proceed the steps which bring you nearer to it; you want to exceed the merely professional frame-work so as to develop your personality in its entirety—and that is all quite good and legitimate. It is therefore to be desired that the most modest worker should gradually come to share in it. After he had been too long treated as a tool of production to be utilized at pleasure, his material condition of life became a subject of preoccupation. It is now realized that it would be quite insufficient to stop there. Since work is a necessity for every man, his professional occupations must not disturb his most natural and spontaneous feelings, but must fully respect his dignity. That is to say, it is not enough to see in him a producer of goods, but he must be treated as a spiritual being, whose work should ennoble him and who expects from his superior, even more than from his equals, understanding of his needs and truly brotherly sympathy.

The engineer, in order to increase his influence and the prestige of his profession, does not have to go outside his own role. In a universe of ever expanding undertakings, splendid tasks await him, provided he is careful not to allow his field of vision to be narrowed down, nor his generosity to wane. Towards that end, let his personal life be well-ordered; let him respect his own highest aspirations, both religious and moral; let selfish interests, the attachment to comfort or wealth, the pursuit of material gain or honour, never stain his ideal, that ideal which you have envisaged in all its nobility. . . .

We wish you that optimistic courage which is never daunted by the inevitable set-backs and difficulties. On your path you will encounter scepticism and misunderstanding; but your faith in the real destiny of mankind will remain unaffected. God, Who knows the depths of the heart, approves of your generous intentions. May He give you the strength to carry them out, and may He protect you, your families and your coworkers.—***End.***

N.S.P.E. Believes

ENGINEERS FOR THE FUTURE

BY PAUL H. ROBBINS, P.E.

Executive Director

N.S.P.E.

ALTHOUGH there may be difference of opinion within the engineering profession as to whether or not there exists today a sufficient number of engineers for the demands of the Nation if all engineers were utilized at their highest capacity, it is certainly evident to all that future developments in the technological field portend a continuing and undoubtedly increasing demand for engineering services. Regardless of the international situation, our economy will offer opportunities for the peacetime developments of atomic fission, expanded opportunities in transportation, improved developments in automation and electronic controls as well as communication, and vast new frontiers in the chemical field. The opportunity these challenges present indicates the ever-widening horizons for engineering development.

These new challenges, together with the increasing role engineers are playing in management and government, have caused many in the engineering profession to pause and consider the effectiveness of engineering education. At the Annual Meeting in Milwaukee, a panel discussion on this important subject brought forth some interesting comments and much thought-provoking discussion.

It is interesting to note that while engineering enrollments have been creeping up in the last few years, the 1953 total enrollment in engineering was still only 7.6 per cent of all the students in U. S. colleges. This percentage is lower than during the period immediately following World War II, and is approximately the same percentage as existed in 1940.

NSPE chapters have been active, in cooperation with other engineering groups, in vocational guidance work at the high school level. The chapters have been urged to encourage all students who have the mental capabilities and the interest in science and math, to consider a career in engineering. Most of those concerned with this work have been careful to point out that unless a young man or woman has interests and capabilities along this line, he would be ill-advised to attempt a career in engineering for the course is certainly far from easy and undoubtedly would not appeal to a person whose motivation was other than a desire to work in these fields.

Alarming facts, however, have been noted as a result of this vocational guidance work. Primary among these is the notation that has been voiced repeatedly by those who are responsible for review of high school graduates as they apply for entrance in engineering colleges and those who have the responsibility for teaching the first-year engineering subjects. It has been pointed out that an extremely low percentage of our high school graduates are well versed in science and mathematics. Statistics show that only 9 per cent of the high school students graduating today have had four years of mathematics. Even more disturbing is that only 7.6 per cent of the high school graduates have had chemistry, and 4.3 per cent have had physics. Thus, it will be seen that the potential of high school graduates sufficiently versed in secondary subjects to enter an engineering career is extremely small.

Equally disturbing are the figures which have been quoted recently, indicating that the country at present is short 30,000 science and mathematics teachers at the high school level. Effects of vocational guidance toward interesting young men and women for careers in engineering thus are considerably hampered until such time as these situations within our high schools have been corrected. Local chapters of NSPE and other engineering groups could do well in discharging their civic responsibilities to make themselves available to present these facts to all civic groups with the hope that the entire population of the Nation may be alert to a very pressing problem directly influencing our technological advancement.—***End.***

book looks

The Book: **How To Write Reports**
The Author: **Calvin D. Linton**
The Publisher: **Harper & Brothers**
Reviewing the Book: **Former NSPE Vice President Alfred J. Ryan, P.E., consulting engineer of Denver, Colorado.**

MR. LINTON has rendered a real service to those engineers who have become aware of the value of a good report. Most engineers have been out of school for quite a while before they realize the importance of an ability to write comprehensible reports, and by that time have forgotten most of the grammar and composition to which they were exposed in school. The time requirement for selective reading of a number of books to determine the basic requirements for the preparation of a good report is such a good excuse that the majority never make the effort. Consequently, engineers are notoriously poor report writers.

In *How To Write Reports*, Calvin D. Linton has provided a way to eliminate this curse on the engineering profession. Any engineer with an interest in improving his report-writing ability can find in this one volume most of the basic information that he needs and plenty of thought-provoking suggestions.

The book is divided into three parts: Part I, The Report; Part II, The Methods; and Part III, The Mechanics. Part I deals with the problems encountered by a reporter in preparing a report regarding the activities of others. Engineers are usually reporting upon their own activities and will not find this part too interesting, but it does contain numerous valuable suggestions for those who have the patience to read through it.

The first two chapters in Part II are entitled, "Research" and "Logic and Clear Thinking." Engineers who pride themselves as being leaders in the fields described by those titles may have some doubts about what they can learn in that regard from a professor of English literature. They are likely to be surprised because the presentation includes points which would not normally be considered by engineers. Of more importance, it establishes the important aspects of preparing reports in a manner that will convey the research, logic and clear thinking upon which they are based.

The information pertaining to identification and diversion of the problem and the methods established for assembling and presenting pertinent information are in themselves clear and logical—so logical, in fact, that one becomes amazed that improper organization is a major fault in so many engineering reports. The terms "logic" and "clear thinking" have definite meanings to all engineers, but few are aware of the numerous ways in which they can fail to convey proof of such logic and clear thinking in the preparation of a report. This problem and its solution are clearly defined on just three pages under the heading, "Common Faults in Logic and Clear Thinking."

The remaining chapters in Section II are devoted to the effective usage of words, sentences and paragraphs, and to effective style. On just 81 pages, Mr. Linton has presented what I believe to be the essential material which is normally covered in several books. Obviously, this material has been highly concentrated, yet it includes everything that is necessary for the report writer who is willing to devote a little thought to applying the concentrated information to his particular problem. Certainly anyone who would become familiar with all of the information contained in these chapters would no longer be guilty of preparing reports which were ambiguous, monotonous or lacking in continuity.

Part III, "The Mechanics," consists of four chapters: The Mechanics of Form; A Grammar Refresher; A Punctuation Refresher; and Visual Representation. All of these, too, are condensations of information which is normally presented in a much more voluminous manner. Yet the chapter on Mechanics of Form presents all of the essential information regarding outlining, note-taking, editing, proof reading, form, and appearance. The chapters dealing with grammar and punctuation can be compared to an engineer's handbook in which the required information can be found quickly, but includes only enough explanation to allow an intelligent application. The chapter on visual representation presents many devices with which the engineer is familiar but it also provides new methods of the effective use of those devices.

In support of my statement that Mr. Linton has provided a way to eliminate the curse on the engineering profession, it may be said that in one small book of 237 pages, he has presented all of the essential information for the preparation of good reports. He has then eliminated the necessity for selective reading of a large number of books to determine the requirements and the methods of application. No longer can engineers blame their lack of ability to prepare effective reports upon the assertion that they have insufficient time to review all of those things to which they were exposed but have forgotten. They now have two alternatives: Either read *How To Write Reports* and improve their ability, or find a new excuse.

Meet the Reviewer . . .

Alfred J. Ryan, who has just completed his term as vice president of the National Society from the Southwestern Area, is a well-known consulting engineer of Denver, Colorado—a man who writes many reports.

Mr. Ryan

He is a graduate of the University of Colorado, from which he received a B.S. in C.E. with special honors in 1933 and a C.E. degree in 1937.

Mr. Ryan has been in consulting practice since 1941, first as a partner in Crocker & Ryan and since 1949 at the head of his own firm. And he has provided engineering services for urban and interstate highways in Colorado, Oklahoma, and New Mexico; military installations in Colorado, Wyoming, Nebraska, and South Dakota; and numerous Federal housing projects. He has also been a consultant to Denver's Off-Street Parking Commission, and has handled many municipal water, sewerage, bridge, and street projects.

In addition to NSPE, he is active in many other engineering, professional, and civic groups.

With Our Members . . .

California Report

Four Chapters Play Host For CSPE Convention and Trade Show

Members of the Peninsula, San Jose, Golden Gate, and East Bay Chapters of the California Society of Professional Engineers played host to the Society's annual convention and trade show which was held May 27-29 at the Hotel Mark Hopkins in San Francisco.

Many notable professional and social events were included in the meeting agenda. Among the principal speakers were: Robert R. Gros who spoke on *Public Relations;* Dr. J. E. Hobson, director of the Stanford Research Institute, who discussed *The Future of Professional Engineers;* and the Hon. Frank M. Jordan, Lieutenant Governor of the State, whose subject was *Engineering Plans for California.*

Three important panel discussions were also featured on the program. They were: *The Registration Law of California,* led by William A. White; *The Legislative Position of the Professional Engineer,* led by Richard J. Dolwig; and *Professional Engineers in Industry,* led by Warren H. McBryde. The chapter presidents' and state officers' seminars were other features of note, and a further outstanding event was the field trip for engineers and their guests to Hunter's Point Naval Shipyard.

Nathan Graves served as general chairman of the convention, assisted by Arthur Bullen, Maurice Ridker, Edward Hayes, and Ralph Daugherty as representatives of the sponsoring chapters.

A special program for the ladies was also arranged under the chairmanship of Mrs. Sherwin Wright, assisted by Mrs. Glenn R. Nelson as vice chairman, Mrs. Louis Bardoff as secretary, and Mrs. William Q. Wright as Treasurer.

San Jose Engineers Elect 1954-55 Slate

New officers for 1954-55 were elected by the members of the San Jose Chapter, California SPE, during the group's recent annual meeting. The new chapter administration includes: A. J. MacDonald, Jr., president; T. J. Smith, vice president; J. A. Sontheimer, secretary; Frank Belick, treasurer; and Leo W. Ruth, state director. Chapter directors also elected were: Walter Bray, Ralph Fitzgerald, and Joseph McKendree.

Congratulations for New Yorkers

In the photo at the left above, NYSSPE President T. M. Linville (left) presents a prize gavel to R. L. Jackson, chairman of the Schenectady Chapter's Membership Committee. In the second photo, D. F. Langenwalter (left), new president of the Schenectady Chapter receives the congratulations of E. P. Smith, retiring president. (See story below.)

Plant Tours For Pennsylvania Chapters

Members of various Pennsylvania chapters have been featuring plant tours in their program schedules recently. Members of the Harrisburg Chapter have toured the new steam power plant of the Pennsylvania Power and Light Company at Sunbury, Pa. Those belonging to the Valley Forge group have been guided through the Sharp & Dohme Plant at West Point, Pa., by engineers of the company, while a recent meeting of the Reading Chapter was devoted to a tour of the local Firestone plant.

Langenwalter Heads Schenectady P.E.'s

D. F. Langenwalter was elected president of the Schenectady Professional Engineers' Society at the annual dinner meeting held recently at the Hotel Van Curler. Other officers include: R. Cutts, Jr., vice president; A. Schmidt, Jr., secretary; C. C. Herskind, treasurer; L. K. Kirchmayer, director; E. P. Smith, director and retiring president; E. J. Remscheid, director; and Gardner Ketchum, director.

Former City Manager, Morris M. Cohn, P.E., was guest of honor and was given a framed certificate in recognition of his work in promoting the interests of the engineering profession. In making the presentation Everett S. Lee, Editor of the General Electric *Review,* saluted Mr. Cohn for his public service as City Manager.

Mr. Cohn addressed the meeting on the subject of "Conservation" which is one of his active hobbies. As a consultant to the Joint Legislative Committee on Natural Resources of New York State, he urged all engineers to be vitally interested in conservation which is essential for both the industrial and community prosperity.

The then president-elect of the NYSSPE, Thomas M. Linville, presented the gavel to the Schenectady Chapter for placing third in the state membership campaign. R. L. Jackson was chairman of the Membership Committee which recruited 50 new members during the year.

Ethics In Engineering Discussed In Rochester

V. George Terenzio, prominent member of the Westchester Chapter, NYSSPE, and division engineer for the Research and Development Department, New York City Board of Water Supply, was guest speaker at a recently-reported meeting of the Monroe County Chapter. Mr. Terenzio lectured on *Ethics in Engineering.*

D. C. Society Announces New Administration

Taking over the administration of the District of Columbia SPE as of July 1 is a new slate of officers headed by Walter H. McCartha as president. In addition to Mr. McCartha, the list includes: Michael F. Godfrey, first vice president; Oscar H. Beasley, second vice president; S. S. Podnos, secretary; Virginia Erwin Page, treasurer; Marion X. Wilberding, director; Nicholas P. Stathis, director; and Joseph H. Powers, national director.

The announcement of the election of the 1954-55 officers was made during the Society's annual banquet, which was held at the Continental Hotel in Washington. Herbert Manuccia acted as toastmaster for the occasion; and the roster of prominent guests included: T. Carr Forrest, Jr., and Clarence T. Shoch, outgoing and incoming NSPE presidents; Brig. Gen. Lewis W. Prentiss, engineer commissioner of the District of Columbia; D. C. Walser, chairman of the District Board of Registration, and Lee J. Purnell, its vice chairman; James J. Corbalis, vice president of the Virginia SPE; and Paul H. Robbins, NSPE's executive director.

Outgoing President C. Warren Bogan gave a report on the District of Columbia SPE's accomplishments during the past year in the business session preceding the banquet.

Connecticut P.E.'s Elect New Officers

New officers of the Connecticut Society of Professional Engineers, who took office on June 7th, include. Edward J. Nesbitt of Westport, president and Alfred L. Koup, Stratford, secretary.

L. M. Reed, of Devon continues as executive secretary of the group, while A. John Macchi has been selected as the new national director.

Monmouth-Ocean P.E.'s Elect Officers

Leonard Grasser, Asbury Park, was elected president of the Monmouth-Ocean Chapter of the New Jersey Society of Professional Engineers during the June 2nd meeting at the American Hotel, Freehold.

Other officers elected and installed by William S. Dean, president of the NJSPE, were: Kenneth Fox, first vice president; George DeGarmo, second vice-president; Craig Haaren, secretary-treasurer; George W. Howland, Jr., state trustee; Julius Soled, alternate state trustee; and George A. Platt and Everett Thorne, chapter directors.

Mr. Grasser, a vice president of the chapter last year, succeeds George Ritter of Matawan as president. An electrical engineer, Mr. Grasser is vice president of the Coby Electric Company, Asbury Park. He served 14 months with the Signal Corps during World War II. He is a past president of the Jersey Coast Electrical League, a member of the Rotary Club and is active in Y. M. C. A. work.

In presenting the gavel to Mr. Grasser, Mr. Dean said the new slate of officers has the important responsibility during the next twelve months of carrying out the trust placed in them to raise the professional, social and economic status of the engineering profession to new levels.

Preceding the installation ceremony a color-sound film titled "Forging in Closed Dies" was presented by Robert A. Main, New York representative of the Rhode Island Tool Company.

Annual Meeting Chairman . . .

To list your meeting under "Dates to Remember," send complete information (date, hotel, city) direct to the American Engineer as soon as it is scheduled.

E.I.T.'s Arrange Lorain County Program

E.I.T. members of the Lorain County Chapter, Ohio SPE, were in charge of a recent meeting that featured D. D. Wyatt of the National Advisory Committee for Aeronautics as guest speaker.

Program Chairman George Bliss introduced the speaker, and others in charge of the meeting were: D. Dobreff, presiding, Richard Haller, Richard Wilt, and John Palik.

Two New Jobs For W. J. Burmeister

Wesley J. Burmeister of Middleton, Wisconsin, was recently elected president of the Southwest Chapter of the Wisconsin SPE. Now he has been named district engineer of Wisconsin's District Two, comprising the counties of Kenosha, Racine, Waukesha, Washington, and Ozaukee, according to an announcement from the State Highway Commission in Madison.

Kaiser Engineers Speak In Rockford

A recent meeting of the Rockford Chapter, Illinois SPE, was highlighted by a program presented by the Kaiser Aluminum Company. Speakers for the occasion included J. M. Welch, M. J. O'Halloran, A. V. Lorch, and Charles P. Boyer, all members of the Kaiser Staff. The meeting was arranged by J. Graven.

Movie On Oil Shown in Los Angeles

Members of the Los Angeles Chapter of the California Society recently saw a movie on *Oil Conservation*, which was shown by Grant Butler of the Richfield Oil Company in advance of its release to the public.

. . . more news on page 31

CAROLINIAN EVENTS—The picture at the left below shows Alonzo L. Jones, president of the New Jersey Registration Board and a past president of the NJSPE, addressing a meeting of the Piedmont Chapter of the South Carolina SPE. Listening to his speech, l. to r., are: T. A. Able, Jr., president of the Piedmont Chapter; T. Keith LeCare, secretary of the South Carolina Board of Engineering Examiners; and Roy Stipp, president of the South Carolina SPE.

The second photo shows the officers of the Central Carolina Chapter of the Professional Engineers of North Carolina assembled for a recent meeting. In the first row, l. to r., are: L. E. Wooten, immediate past president; W. E. Harris, president; and Bernard Crocker, Jr., vice president. In the second row are: J. F. Pou, governor; T. C. Cooke, governor; and J. D. Joslin, secretary-treasurer.

Alphabetized by States

Professional Directory

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Columbus Meeting Marks Certificate Presentation

Members of the Franklin County Chapter, Ohio SPE, recently sponsored their 14th presentation of certificates to newly-registered engineers. The event, preceded by a dinner meeting, was held in the new Ohio Union on the Ohio State University Campus in Columbus.

T. F. Hindman, member of the State Board of Registration, presented the certificates; and Solomon Morton Isaac, a past president of the Columbus Bar Association, was guest lecturer, speaking on the subject, *Why Bother With Ethics?*

For the occasion the Franklin County P.E.'s acted as hosts to the following chapters: Central Ohio, Eastern Ohio, Hocking Valley, Marion, Muskingum Valley, Ohio Valley, Portsmouth, Southern Ohio, and Zanesville.

Traffic Safety Is Meeting Topic

Traffic Safety was the subject of a talk given before a recent meeting of the Professional Engineers Society of Hudson County, New Jersey. The guest speaker for the event was Lieutenant Thomas Finnie of the Jersey City Police Department.

Another recently-reported event of the P.E. group was the annual scholarship award and testimonial dinner held June 9th at The Hotel Plaza in Jersey City. Chapter President Stephen H. Harnett was the honored guest for the occasion.

Hartford Chapter Holds Annual Meeting

Members of the Hartford Chapter, Connecticut SPE, held their annual meeting recently at the Old Town Hall Inn in East Hartford. Guest speaker for the occasion was Charles L. Derrick, vice president in charge of engineering and operations for the Hartford Electric Light Company. He chose as his topic, *Electric Service Development to Take Care of Future Industrial and Economic Expansion.*

C. F. Beames is chapter president.

. . . more news on page 33

MAHONING VALLEY AUXILIARY—Pictured at the right are officers of the auxiliary to the Mahoning Valley Chapter of the Ohio SPE. Seated, l. to r., are Mrs. N. V. Cox, president; Mrs. W. Ault, vice president; and Mrs. H. Withers, secretary. Standing, l. to r., are Mrs. C. Conklin, Jr., director; Mrs. W. Raub, director; and Mrs. G. Mandry, treasurer. Two other directors, Mrs. R. E. Evans and Mrs. A. Lowinger, were absent when the photo was made.

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Linville Takes Helm Of New York Society

Thomas M. Linville of Schenectady, New York, took office June 1 as president of the New York State Society of Professional Engineers. He succeeded Carl M. Gilt of Brooklyn.

Mr. Linville is manager of the Research Operation Services Department of the General Electric Company, which he first joined in 1926.

During World War II, Mr. Linville served as a member of the United States Naval Technical Missions at Pearl Harbor in 1942 and in Europe in 1945. He received the Charles A. Coffin Award for outstanding development of design methods for submarine propulsion equipment.

Mr. Linville is a fellow and member of the Board of Directors of the American Institute of Electrical Engineers. He is a member of the American Society of Mechanical Engineers, American Society for Engineering Education, American Association for the Advancement of Science, Society for Advancement of Management, and the American Management Association. He has served as Chairman of the Schenectady City Planning Commission, Director and Vice President of the Schenectady Chamber of Commerce, and President of the New York State Citizens Committee for the Public Schools.

Other New York State Society officers for the year beginning June 1 are: Herbert F. Roemmele of Port Chester, first vice-president; Lewis J. Sforzini of Rochester, second vice-president; Patrick M. Corry of the Bronx, treasurer; and Richard B. Richardson of New York, financial secretary.

Picnics Are Planned By Many P.E. Groups

With the advent of summer weather many chapters are bypassing the strictly professional meeting for picnics and other social events held out of doors.

June 19th was the date of the St. Louis Chapter's annual picnic at Schaefer's Summer Camp. Members of the Jackson Chapter of the Michigan SPE scheduled a similar event for June 23rd in conjunction with the local Toastmasters Club. The Ladies' Auxiliary to the Tulsa Chapter, Oklahoma SPE, has also recently sponsored a family picnic for the entire chapter group, and another "family night" picnic was organized as the June meeting of the Washington County Chapter of the Pennsylvania Society.

A recent dinner meeting of the Akron District Society of Professional Engineers was held at the Brookside Country Club and was preceded by a day of golf, while a day-long picnic was also recently scheduled by another Ohio P.E. group—the Cleveland Society.

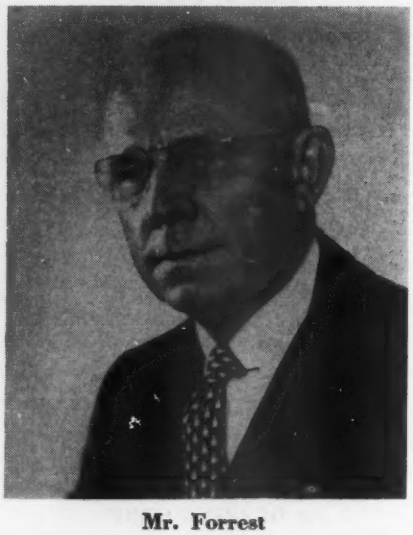
Members of the Stanislaus Chapter of the California SPE are planning a picnic for either July or August, while the P.E.'s of the Sabine Chapter, Texas SPE, have already held their annual outing at the Flying Red Horse Club near Beaumont.

Southern Methodist University Honors Forrest and Robertson

Two distinguished Texas engineers —T. Carr Forrest, Jr., and Elgin B. Robertson—received honorary doctoral degrees during commencement ceremonies at Southern Methodist University in Dallas on June 1.

Mr. Forrest, who is the immediate past president of the National Society of Professional Engineers, received his Doctor of Engineering degree in recognition of his "pioneer work in the development of flood control in Texas and the Southwest." Mr. Robertson, who is president of the American Institute of Electrical Engineers as well as being a prominent member of NSPE, was cited for his "contributions to the advancement of engineering as a profession."

Mr. Forrest, who is a partner in the Dallas firm of Forrest and Cotton, is noted as the designer of the Trinity River levees and the Trinity Industrial District and for his work as a consulting engineer for the Texas Centennial and the New York World's Fair. Since 1946, he has been specializing as a consultant in water supply and other municipal problems.



Mr. Forrest

Mr. Robertson has been president of Elgin B. Robertson, Inc., of Dallas since 1928 and has also headed the Plastic Manufacturing Company of the same city since 1929. During World War II he was regional manager of the War Production Board's production division.

Both men have also been extremely active in the Texas Society of Professional Engineers, for which Mr. Robertson once served as president, and in other engineering, professional and civic organizations.

Who's Who In Engineering Reprints Available

The publishers of *Who's Who in Engineering*, the seventh edition of which appeared early this year, have announced an extension of the reprint service that has long been a feature of the publication.

Heretofore this was offered only when the book was delivered; now any individual listed in the volume may order reprints of his record as it appears in quantities from 100 to 500 at a cost of from $6.00 to $12.00.

Full information is available from the Lewis Historical Publishing Company, Inc., 265 W. 14th Street, New York 11, New York.

Hawaii

(*Continued from page* 13)

foundation, wound up with no piles. The complete basement had to be redesigned as a spread footing, with allowance for settlement of the whole structure as additional stories were added. Engineers have tagged Waikiki with the nickname "geologic cesspool" since bedrock is probably more than 700 feet deep.

The usual soil tests failed to predict adequately the service behavior of certain soils recently encountered in the construction of the Hawaii Belt Road on the Island of Hawaii. This road, built at a cost of $17,500,000 to replace the railroad destroyed by the 1946 tidal wave, contains 40 bridges in a distance of 40 miles, including many major bridges one of which crosses a gulch 190 feet deep and 772 feet long. Several of these bridges were converted from single track railroad bridges to two-way highway bridges.

In one section of the highway where the rainfall exceeds 200 inches per year, a soil was encountered over a considerable distance that had a moisture content of up to 200 per cent, yet this soil would remain stable in a cut of up to 15 or 20 feet deep on side slopes of 1½ to 1. With rainstorms of 8 to 12 inches in 24 hours not uncommon in the area, this seems most unusual to say the least. The minute this soil is excavated and worked in an attempt to use it as fill, it becomes semi-liquid and a mud flow results. Once dried, it will not reabsorb its former moisture content. Since it never stopped raining long enough to dry out the material, and since the bringing in of other material for the fills from a distance was too costly, the manner in which this problem was solved by the Territorial Highway Department involved depositing the fill in layers of up to eight feet. After about a month, the material compacted itself and another thick layer was deposited. While this procedure was somewhat slow it proved to be the only practical solution.

THE Industrial Research Advisory Council, among others, has been instrumental recently in planning a more diversified economy for the Territory by studies to promote new industries and products as well as to expand existing industries. While sugar, pineapple, tourists and their related "service industries" are the backbone of the economy, many other enterprises are by no means minor, such as fishing and tuna canning, ranching, farming, and the manufacturing and processing of many types of consumer goods. The new industry of raising and processing macadamia nuts is on the road to large-scale production.

The Territory was among the earlier entities requiring the registration of engineers and architects to practice their professions, enacting such a law in 1923. The law has been amended periodically to keep abreast of the changing times.

With the possibility of statehood in the offing and the increased knowledge of Hawaii acquired by the servicemen during the war and by other visitors since then, it is already apparent that considerable capital is being attracted to the islands. The actual attainment of statehood will undoubtedly stimulate the economy even more. This, in turn, will keep the engineers in Hawaii on their toes to meet new, unusual challenges of the future as they have so successfully solved others in the past.—*End.*

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Annual Meeting

(*Continued from page* 20)

The members of the seven chapters of the Wisconsin Society (Fox River Valley, Milwaukee, Northwest, Southeast, Southwest, Western, and Wisconsin Valley) staffed the committees that handled arrangements for the meeting. Harry Gute served as general chairman of the Steering Committee. Chairmen of the other committees were: Orrin E. Andrus, Program and Entertainment; Robert W. Smeaton, Publicity; Ray E. Behrens, Registration; Guy V. Woody, Finance; W. C. Lallier, Greeters; and Harry S. Fullwood, Arrangements. Mrs. Edwin W. Seeger and Mrs. Harry Gute headed the Ladies' Entertainment Committee.

BOARD ACTION AND DECISIONS

Important action taken by the Board of Directors during the course of the meeting was as follows:

Abrogation of Membership Requirement

A resolution to eliminate the requirement for joint and simultaneous membership at the state, chapter and national levels was defeated.

Board of Ethical Review

Approval was given to the establishment of a Board of Ethical Review which will render opinions pertaining to ethical practices. The Board will consist of six members representing the administrative areas of NSPE organization. Opinions will be given at the request of state societies. If approved by the Board, the opinions will be published in a yearly compilation.

Budget

Minor changes in the budget were approved, but they did not change the totals under major headings. Additional funds were provided the Constitution and Bylaws and Engineer in Industry Committees.

Committee Meetings

The newly-appointed Membership, Interprofessional Relations, and Engineer in Industry Committees held preliminary planning meetings during the sessions. The Professional Engineers Conference Board for Industry also met and selected the problem of Training of Professional Engineers for the content of its next Executive Research Survey Report.

Constitution and Bylaws Changes

Board approval was given to the submission of an amendment to the full membership to clarify conditions of affiliation for newly-constituted state societies. The amendment would give the Board discretion in applying the percentage of registered engineers required in the case of existing members of the state group.

A motion to eliminate the ballot for election of officers if there is no contest for any one of the offices was defeated. Also defeated was a move to revise the bylaw dealing with reinstatement of members who have been dropped for nonpayment of dues. The proposed change would have eliminated the mandatory requirement that the dropped member pay one year back dues plus current dues. The Board then approved a rewording of the bylaw to clarify its present intent.

Future Meetings

Charlotte, North Carolina, was selected as the site for the Spring, 1955, Board meeting. By previous decisions, the next Board meetings will be: Omaha, Nebraska, November, 1954, and Philadelphia, Pennsylvania, for the 1955 Annual Meeting.

Gentlemen's Agreements

The Board approved a statement of policy opposing agreements between employers which preclude consideration of an applicant for employment unless he has severed employment relations with his current employer.

Legislation

The Board re-affirmed its policy favoring the establishment of a joint military-civilian board to develop policies applicable to the recall of specialized persons in the military reserve. Approval was also given to a bill to clarify the wording of the Selective Service Act with respect to the "selection" concept.

Membership Certificate

A resolution to provide a membership certificate without charge to all new members was rejected because of budgetary limitations.

Name of EIT Members

The suggestion of the Young Engineers Committee that the designation, "engineer-in-training" member be changed to "junior" member was referred to the Constitution and Bylaws Committee with instructions to prepare the necessary amendment to the Constitution and Bylaws to accomplish the change.

Nominations

The new Nominating Committee, which will select candidates for all offices for the administrative year 1955-56, was named. It will be headed by Past President Coleman of Ohio. Other members are: W. P. Henoch, Utah; W. K. Wagner, New Mexico; R. K. Rouse, South Carolina; T. B. Evans, Delaware; H. J. Bruegging, Missouri.

Registration

The Registration Committee plans a survey of member opinion on key features of the registration laws with some 30 specific points to be covered. It was suggested that further study be given to the National Certificate for Engineers and that further study be given to registration by eminence.

Retirement Program

The Insurance Advisory Committee presented a retirement plan for NSPE employees which was approved. Employees of state societies will also be eligible. Under the plan, which is contributory and voluntary, retirement provision is made at 65 years of age.

Teaching Mathematics in High Schools

A resolution emphasizing the importance of training in mathematics in high schools and secondary schools and favoring NSPE study of means to assist in developing courses and in having advanced mathematics introduced into high school curricula was referred to the Education Committee.

Unity

A new unity resolution, which was approved, instructed the president of NSPE to notify the president of AIEE of the several actions taken with respect to cooperative action in developing a unity organization.

Vice Presidential Succession

As required by the Constitution and Bylaws, the Board voted on order of succession of vice presidents if the president is unable to act. Vice Presidents-elect Rinehart of Arkansas, Frazza of New Jersey, and Wooten of North Carolina were chosen for the first three priorities.

Young Engineers' Program

A number of suggestions of the Young Engineers Committee for action at the national and state levels were approved in principle, to be implemented to the extent practicable. Among the major suggestions: junior members on selected national committees, publication of a brochure for junior members, a special Young Engineers page in the AMERICAN ENGINEER. At the state level, the suggestions included: sending letters of congratulation and recommendation to become registered to all graduate engineers, issuance of a "courtesy card" to all graduating engineers, furnishing speakers for student meetings, providing counselor service, assisting in finding part-time employment, sponsoring student chapters or councils, and considering full voting privileges for junior members.

—End.

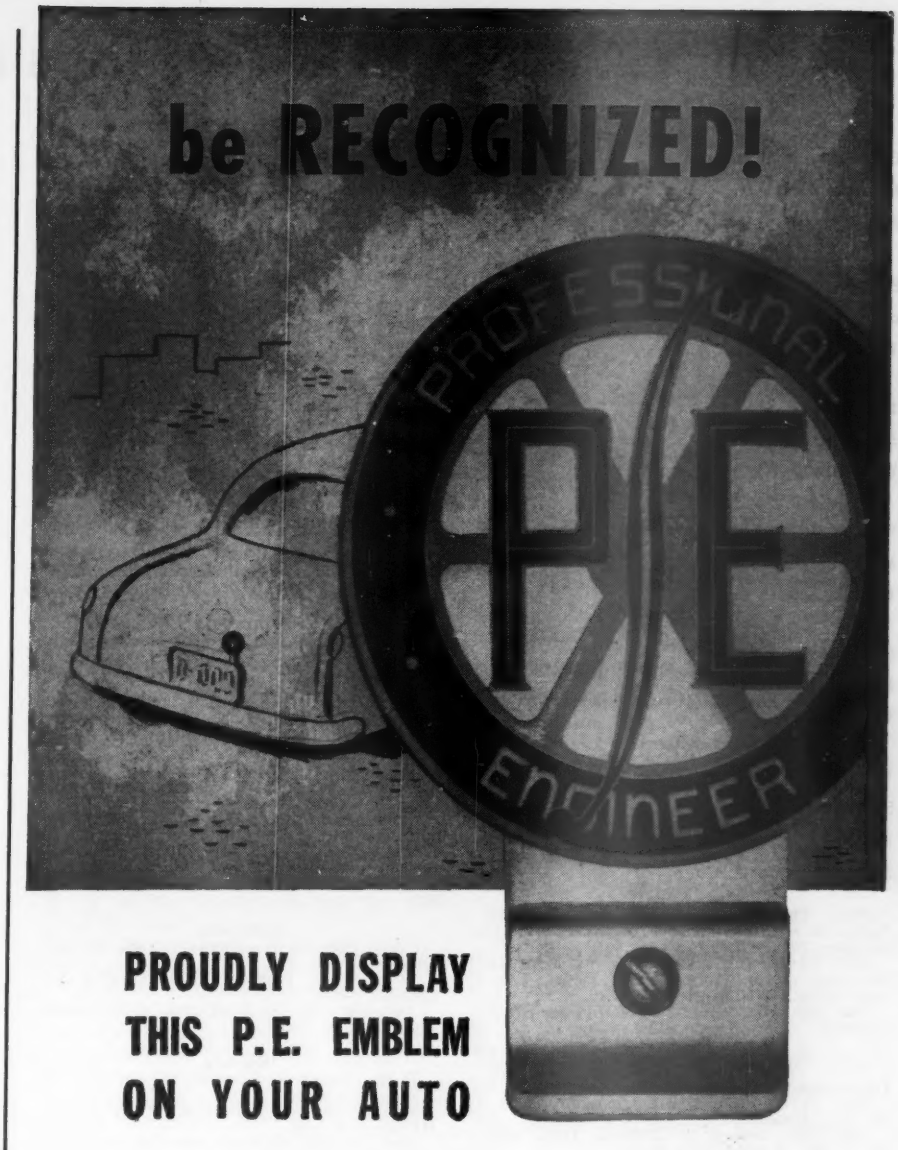
Robbins Appears On TV Program

NSPE Executive Director Paul H. Robbins and three other prominent engineering figures took part in a televised panel discussion June 3 sponsored by the Georgetown University Forum in Washington, D. C.

The topic of the discussion was "Who Manages Your Life?" A transcription of the program was rebroadcast over 70 radio stations.

With Mr. Robbins on the panel were Martin A. Mason, dean of the Engineering School at George Washington University, and James C. Stephens and Charles L. Stec, both engineering executives for the Navy.

The program was centered around the idea that engineers have moved into a commanding position today since they have accepted a large area of management responsibility.



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Letters

(*Continued from page 3*)

3) The development, design, construction, and operation of nuclear reactors involves practically all the sciences and branches of engineering.
4) Industry has been most successful by absorbing engineers trained in fundamentals, with the industry furnishing the specialized know-how.

The nuclear energy business requires imagination and the extrapolation of experience brought to it from other fields. This imagination and outside experience is an important nutrient in these early stages of development. We should avoid the pitfalls of specialization and an inbred engineering approach if we are to solve the novel problems in this new business.

Our engineering school establishments can superimpose into the basic curricula the necessary nuclear physics, radio chemistry, and nuclear technology. The broader the base of education and experience the more virile will be our nuclear technology. Any attempt to establish nuclear engineering as a new branch would work to place an artificial recognition on a selected few who dare not assume such a monopoly of the necessary talents.

A. P. Weber, P.E.,
New York, N. Y.

Corporate Practice . . .

Dear Editor:

In the May issue of the American Engineer, we find two articles giving the pro and con of corporate practice. However, the heading, "Should Corporations Practice Engineering?" can have but one response. That is "Yes." Corporations are practicing legally all over the world.

Despite the fact that the New York Society seems to say "No," its "No" must be a qualified negative, for New York State does now register certain corporations, exempts others, and permits corporate practice by others in manufacturing and processing fields.

It is probably more accurate to say that the New York Society advocates that no additional corporations be registered or licensed to practice engineering. Perhaps the two articles might have been more appropriately headed, "Should Corporations Be Registered (or Licensed) to Practice Engineering?" It seems much easier to answer that question with a "No."

It seems most regrettable to this interested bystander that the Pros and Cons in this matter have not thus far been able to resolve their differences around a friendly conference table.

It is very difficult for this writer to understand why any statute of a regulatory nature, providing for licensing or registration of individuals, intended to protect the life, health and welfare of the public, should be broadened to provide for corporate registration. An individual can be required to submit to qualifying examination. Most certainly, this is not possible for an inanimate corporation.

The basic reason for engineering license or registration laws throughout the Nation is that they offer a yardstick for the measurement of individual proficiency in the interest of protecting the public.

Likewise it is fundamental that such legalization was always intended to be a personal authorization. There is, however, a vast difference between corporate registration or licensure and corporate practice of engineering.

At the risk of being considered presumptuous by both sides, it would seem that the sound solution of New York's problem is the elimination of corporate registration, with amendments to the law to permit corporate practice under proper suitable safeguards, consistent with such provisions now in effect in many other states.

I am confident that both sides are vitally concerned with and interested in the future of the engineering profession. Assuming that is so, then the least we can expect is that both will determine to resolve their divergent view points and thus arrive at some mutually satisfactory solution.

May we soon see the New York State Society of Professional Engineers and the Committee on Engineering Laws marching up the professional road together toward greater professional unity and achievement.

W. Earl Christian, P.E.,
New Brunswick, N. J.

Weakened Education . . .

Dear Editor:

I wish to express my complete agreement with the thoughts of George C. Barnes, Jr., P.E., in the May number. He has "hit the nail on the head."

In my opinion, engineering education is being weakened in a time of national peril by the efforts of the "educationists" themselves. This is the first time I have seen such an excellent statistical analysis of the complete educational program for the entire sixteen year period.

This serves to confirm the impressions gathered in my forty years of varied practice, industrial and teaching, that we engineers are being sold a "bill of goods." We should not fall for it, but should demand correction in the grade and high schools.

We cannot afford to further weaken engineering education by the elimination of technical subjects to make room for general subjects given inadequate coverage in earlier years. Engineering is advancing too rapidly for such a course.

Carroll D. Billmyer, P.E.,
Kingston, Rhode Island

Next Month . . .

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---NEW PROCESSES---

Nails That Look And Act Like Screws

A new process in the nail manufacturing industry has brought about a nail that looks and acts like a screw but can be pounded in with a hammer, according to Threaded Nails, Inc. of Morton Grove, Ill. These threaded nails first became known in World War II and now are finding widespread application in industry, on the farm and around the home.

Currently, the how-to-do-it-yourself public has discovered these nails too and find that threaded nails hold from two and one-half to seven times as well as smooth nails. Already these threaded nails are used in automobile and truck body frames, in construction of boats and bridges, freight cars and trailer coaches. Shippers count on them to keep railroad car blocking in place and to make certain export crates stay in one piece. The building industry employs these nails in building concrete clamps and frames, for fastening asbestos side wall shingles and for laying hard wood floors. Toy makers use threaded nails as a means to keep children from pulling their products apart.

One of the leading applications of threaded nails is in the manufacture of pallets, wooden platforms used to handle materials. It is easy for a crane to grapple a pallet loaded with anything from cartons of breakfast cereal to 155 mm shells and hoist the cargo into the hold of a ship. Lift trucks in warehouses thrust their prongs beneath similar pallets and goods on them can be handily stacked.

Since Uncle Sam adopted the pallet for use in the armed forces government specifications for pallet construction were changed when it was realized that the threaded nails could be substituted for bolts with a saving of time.

New time and money saving uses for these nails are turning up as fast as the ingenuity of industry and homeowners suggests them.

Cost Reduction

A new process that will bring about a major reduction in the cost of manufacturing ethylene oxide, used in making detergents, permanent antifreeze and many other products has just been developed by Scientific Design Co., Inc. of New York. The process produces ethylene oxide by the direct oxidation of ethylene with air and eliminates the use of chlorine as an indirect oxidant and it is expected it will bring about a greater use of these chemicals.

Direct Color Prints

A low cost direct color print, Chromastat, has been adopted by Quinton Engineers, Ltd., Los Angeles consulting engineering firm, to give the story of their services to business and industry. Because color affects people's desires and actions, its importance is recognized as a prime mover in sales work. With the advent of the new low cost and rapid method of reproduction, it is now Quinton Engineers' policy to use direct color reproductions from illustrations of their projects, for use in presentations to show how they coordinate their combined services for industrial and public works projects.

Plastics Mold Release

A new mold release for polyester, epoxy, and other plastics and materials has been developed by the Chemical Development Corp. of Danvers, Mass. It is intended for use primarily on porous or semi-porous molds, including wood, polyester, plaster of Paris, aluminum and similar materials. It has several additional uses because of its high heat resistance and other characteristics.

Advertisers' Index

Acme Fire Alarm Co., Inc.	3
Adache & Case, Engineers	32
Aerofin Corporation	39
Auburn & Associates, Inc.	32
B. H. Backlund & Associates, Inc.	30
Bettenburg, Townsend & Stolte	30
George W. Brandt, Engineer	32
Brown & Blauvelt	31
Builders Estimating Service	33
Capitol Engineering Corporation	32
The Carter-Waters Corp.	39
Commonwealth Associates, Inc.	30
Consoer, Townsend and Associates	30
Cormit Engineering Company	32
Crescent Engineering Company, Inc.	30
Geo. E. Deatherage & Son	36
DeLeuw, Cather & Company	30
Fred S. Dubin Associates	30
Thomas E. Duce Associates	32
Eastern Heat Treating & Brazing Corp.	33
Ehrco Die Casting Service	33
Electro-Search	32
Engineers Testing Laboratory, Inc.	33
Eustis Engineering Company	30
Fay, Spofford & Thorndike	30
Orrin E. Fenn	30
Forrest and Cotton	33
Frazier-Simplex, Inc.	32
Gannett, Fleming, Corddry & Carpenter, Inc.	32
General Electric Co.	5
Gustave M. Goldsmith	32
Greer & McClelland	31
Frank E. Harley & Associates	31
C. M. Hathaway	30
The Hinchman Corporation	30
James H. Howard and Associates	33
Howard, Needles, Tammen & Bergendoff	31
Kaiser Engineers	30
Kennedy-Riegger Drilling Co., Inc.	39
Knappen-Tippetts-Abbett-McCarthy	31
Law-Barrow-Agee-Laboratories, Inc.	30
Lawrie & Green & Associates	32
Madigan-Hyland	31
Emmet J. McDonald	32
Metcalf & Eddy	30
Mercury Engineering Co.	33
Maurice P. Milliken	32
Modjeski and Masters	32
Narva Products, Inc.	3
Niagara Blower Co.	7
H. C. Nutting Co.	32
James P. O'Donnell	31
Oklahoma Testing Laboratories	32
Palmer & Baker, Inc.	30
Parsons, Brinckerhoff, Hall & Macdonald	32
Potteiger Company, Inc.	33
Princeton University Press	6
Revolvator Company	3
Cyrus Wm. Rice & Co., Inc.	32
Robert and Company Associates	30
Lloyd N. Robinson	33
F. A. Sando	30
Seelye, Stevenson, Value & Knecht	32
Singstad & Baillie	32
W. W. Slocum & Co.	31
South Florida Test Service	30
D. B. Steinman	32
Max Stern, P.E.	33
Syska & Hennessey, Inc.	32
Thomas Gas Contractors, Inc.	39
John I. Thompson & Company	30
Toledo Testing Laboratory	32
United States Testing Company, Inc.	31
Emerson Venable	32
Warren-Knight Co.	6
Edward J. White Company	39
H. P. White Lab.	30
Whitman, Requardt and Associates	30
E. J. Will & Company	39
A. W. Williams Inspection Co.	30
Wilson & Company	30

Strictly Business

Personalities . . . NEIL J. CAROTHERS, former deputy director of production, ATOMIC ENERGY COMMISSION, has accepted the position of assistant to the president of the ALBERT M. HIGLEY COMPANY, Cleveland, Ohio, industrial and commercial building contractors. . . . REID W. MALCOLM, JR., has been appointed director of research and development with the R. M. HOLLINGSHEAD CORPORATION, Philadelphia, according to WILBUR H. NORTON, president. . . . NORMAN J. FRANK has joined the firm of BECK, SIMON & MANTEL, structural engineers of New York and New Jersey. . . . RALPH L. LEADBETTER of Dallas, Tex., has been elected president of the BURGESS-MANNING COMPANY, Libertyville, Ill., manufacturers of industrial noise abating equipment. . . . HERMANN A. BOTTENHORN, rolling mill chief engineer of HYDROPRESS, INC., New York, has been elected vice president in charge of the Rolling Mill Division, according to ERWIN LOEWY, president; and ERNEST E. KUGEL, director of rolling mill sales, has been elected a member of the firm's board of directors. . . . RAY C. BURRUS has established offices with ASSOCIATED CONSULTANTS, INC., in Washington, D. C.

Mr. Carothers

►

E. J. LONGYEAR COMPANY, Minneapolis, has announced the appointment of ALLYN E. HARPER to the position of chief of the firm's Mechanical Engineering Division. . . . H. MONTEITH ALBERS, vice president of KENSINGTON STEEL COMPANY, Chicago, has been elected to the company's board of directors and appointed to its executive committee. . . . L. M. HENDERSON has been appointed manager of operations and H. R. ARNOLD has been named manager of foreign relations and administrative assistant for the Aviation Gas Turbine Division of the WESTINGHOUSE ELECTRIC CORPORATION, Philadelphia, Pa. . . . ARTHUR G. THORP II has joined the staff of the EDISON RESEARCH LABORATORY in a senior mechanical engineering capacity, it has been announced in West Orange, N. J., by DR. DONALD W. COLLIER, director of research of THOMAS A. EDISON, INC. . . . HOWARD D. BROWN has been appointed an engineering representative in the Detroit office of the ROLLWAY BEARING COMPANY, a subsidiary of LIPE-ROLLWAY CORPORATION, both of Syracuse, N. Y.

Mr. Albers

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New Firms and Offices . . . FRANCIS L. BROWN, HAROLD A. BLAUVELT, and JACKSON D. LEONARD have announced the formation of BROWN, BLAUVELT & LEONARD, chemical and industrial engineers, with offices at 470 Fourth Avenue, New York City. Messrs. Brown and Blauvelt are partners in the consulting engineering firm of BROWN & BLAUVELT with which the new company will be affiliated. Mr. Leonard formerly headed J. D. LEONARD & ASSOCIATES, consulting chemical engineers. . . . JAMES C. MALONE, JR., has announced the opening of an office for the practice of mechanical engineering at 2105 Third Avenue, North, in Birmingham, Ala.

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Ownership Changes . . . A group of employees, headed by THOMAS W. ALDER as president, has purchased BARNES AND REINECKE, INC., Chicago design, research and development engineering firm. The company, which originated as a partnership some years ago, has been owned for the past year by the JOY MANUFACTURING CO. of Pittsburgh. . . . The board of directors of AIR REDUCTION COMPANY, INC., New York, has approved the acquisition of the assets and business of THE COLTON CHEMICAL COMPANY, Cleveland, O., in exchange for Air Reduction common stock, according to an announcement by JOHN A. HILL, president. It is anticipated that Colton Chemical will operate as a division of Air Reduction, with headquarters remaining in Cleveland and the organization continuing intact. . . . H. K. PORTER COMPANY, INC., Pittsburgh, Pa., has announced the acquisition of PIONEER RUBBER MILLS, INC. of Pittsburg, Cal., largest manufacturer of industrial rubber products on the Pacific coast. T. M. EVANS, president of Porter, stated that the purchased firm would become part of the QUAKER RUBBER CORPORATION, one of the H. K. PORTER COMPANY's nine divisions, while retaining its own identity.

►

Operational Expansion . . . The UNIVERSAL CONCRETE PIPE COMPANY has begun production in its third Flexicore precast concrete slab plant, located at New Martinsville, W. Va., according to T. H. MONAGHAN, vice president. . . . The ALUMINUM COMPANY OF AMERICA has announced the start of production in its new tapered aluminum sheet and plate rolling mill at Davenport, Iowa. ALCOA has also recently dedicated a new aluminum smelting plant in Rockdale, Texas. The latter has a capacity of 90,000 tons annually.

►

Contract Awards . . . The MERRITT-CHAPMAN & SCOTT CORPORATION of New York has been awarded the contract for the construction of the substructure of the new bridge to be built across the Hudson River north of Kingston. The projected bridge has been designed by D. B. STEINMAN of New York. . . . HEWITT-ROBINS, INC., Stamford, Conn., has been awarded a contract to build a belt conveyor system approximately one mile long at the ALPHA PORTLAND CEMENT COMPANY plant at Catskill, N. Y. . . . The STONE & WEBSTER ENGINEERING CORPORATION of Boston will perform architect-engineering services associated with the design of the nuclear portion of the pressurized water reactor project to be constructed near Shippingport, Pa., according to an ATOMIC ENERGY COMMISSION announcement. STONE & WEBSTER will be a subcontractor under the WESTINGHOUSE ELECTRIC CORPORATION which has responsibility for the nuclear portion of the PWR project under its prime contract with the Commission.

What's New

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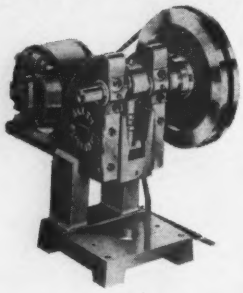
BENCH TYPE PUNCH PRESS — Item 1



A power bench type 1-ton punch press developed by Alva F. Allen is said to be one of industry's most valuable small tools. Ideal for short runs or small work. Frees heavier equipment. Operated at lower cost. A new, simple single pin clutch gives positive clutching action and is operated by a convenient hand lever. In continuous operation, the Allen has a capacity of up to 200 operations per minute. Operated by direct V-Belt drive. Weight 105 pounds. Requires only a ¼ to ½ H.P. Motor.

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NEW PROTECTIVE COATINGS — Item 2

HYDROCIDE COLORCOAT is said to fill the need for a coating that protects, beautifies and makes exterior masonry walls water-repellent *with only one application*. One coat fills hairline cracks and voids in surfaces as porous as cinder block. Silicone in Hydrocide Colorcoat imparts outstanding water repellency. To withstand wide temperature changes without cracking, Colorcoat is formulated with an oil base strengthened by asbestos fibers and other agents. Available in colors for every need, Hydrocide Colorcoat can be applied by either brush or spray for a colorful, textured finish. Besides its use on exterior masonry, Hydrocide Colorcoat is also applied over masonry, wood, plaster or plasterboard.

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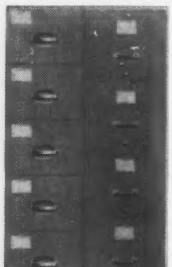
KOMPAKT SPACE SAVERS — Item 3



"The file with the extra drawer" is the feature of Remington Rand's new line of Kompakt file cabinets. The line is available in 3-drawer desk height, 4-drawer counter height, 5-drawer standard 51" height and new 6-drawer height, designed to accommodate an extra drawer in the same vertical space as standard files. By using the new 6-drawer unit, for example, in place of existing 4-drawer files, present filing area can be reduced one-third. Photo shows new 5-drawer Kompakt file next to standard 4-drawer unit.

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NEW D.C. AMPLIFIER — Item 4

A new approach in industrial and laboratory D.C. amplifiers was announced by the Fielden Instrument Division of Robertshaw-Fulton Controls Company. The new Series 80 D.C. Amplifiers convert low level D.C. micro-amphere or millivolt inputs to a high level D.C. current output.

Incorporating a high gain feed back loop, the new amplifier has exceptional long and short term stability characterization. It is suitable for many laboratory applications involving the measurement or recording of low level D.C. signals, and has also been designed for industrial use, particularly as a thermocouple amplifier. The company says other applications can be developed.

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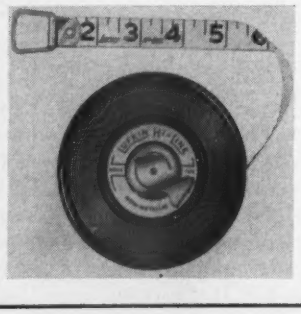
NEWEST MIRACLE FIBERS IN TAPE — Item 5

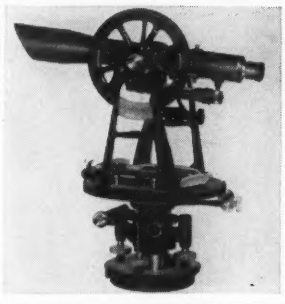


The toughest miracle fibres recently developed by science are used in this new Lufkin Hi-Line non-Metallic Woven tape, which is designed in every way for longer wear. Said to have greatest dimensional stability—even after it is repeatedly soaked and dried. Markings are protected by coatings of specially compounded plastic that is resistant to abrasion, cracking, mildew, moisture and temperature changes.

This column describes new products of general interest to professional engineers. For further information, fill in the coupon provided and mail to the AMERICAN ENGINEER.

NEW TRANSIT HAS 29 FEATURES

Item 6



This new Warren-Knight instrument will maintain its precision accuracy in spite of rough field handling. All working parts are brass, bronze or nickel silver. Features include: 24 power internal focusing telescope, hinged vernier reflectors, lifetime focusing mechanism, waterproof mountings, extra strong leveling head, 4½′ close focus, etc. Graduations differentiated by both SIZE and *slant* to eliminate errors. Very light weight, 12¾ lbs.

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NON-SLIP SURFACING FOR PULLEYS

Item 7

A new type of "Safety-Walk" brand waterproof non-slip surfacing with a mineral coating of traprock has been developed especially for pulley lagging by Minnesota Mining and Manufacturing Co. of St. Paul.

Known as types "E" and "F", the surfacing is a thin, tough fabric flexible enough to be adapted for use on any type of industrial pulley. It can be spiral-wound or applied in section. Both types are identical—only the method of application differs: type "E" requires a separate adhesive; type "F" is manufactured with a pressure sensitive adhesive backing.

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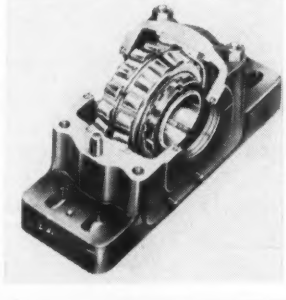
HEAVY DUTY "MILL BEARINGS"

Item 8



New, heavy duty roller bearings, especially designed for the severe operating conditions found in steel mills, mines and foundries, have been added to the extensive line of bearings manufactured by Link-Belt Company. These "mill bearings" incorporate precision Link-Belt self-aligning roller bearings in a particularly rugged steel pillow block housing. Withstands the heavy loads and severe impacts found in mill operations. Made in shaft sizes from 2 7/16 to 6 15/16 inches in diameter. Additional information, including dimensions and load ratings is available. (No. 2565.)

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IMPROVED GRADALL UPPERSTRUCTURE

Item 9

Contributing to still smoother operation, easier maintenance and greater operator convenience of the Gradall, three new design modifications and construction improvements in this mobile, multi-purpose earthmoving machine are announced by the Gradall Division of the Warner & Swasey Company.

First and most important is a simplified method of mounting the three-unit pump supplying hydraulic pressure for machine operation. Second major improvement is the use of a new engine instrument panel, including an engine hour meter, within the operator's cab. Third upperstructure improvement is the relocation of the swing flow valve to simplify its adjustment.

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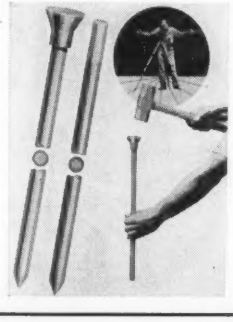
PERMANENT MARKERS FOR SURVEYS

Item 10



Copperweld Steel Company is introducing new Survey Markers of non-rusting copper-covered steel to provide permanently-marked boundary lines. Consists of a strong steel core to which a thick copper covering is inseparably molten-welded, providing strength for easy driving without splintering, bending or breaking. There are 2 types. One has high visibility from 1½-inch brightly-tinned end, one-half or ⅝-inch dia. for use in uneven or heavy-foliaged ground. The other compression-fit 1½″ dia. bronze head, for center-punching point of reference, driven flush pavements, roadbeds, etc.

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...loyees . . ."

A. W. STEUDEL
President
Sherwin-Williams Company

"Naturally, we of Sherwin-Williams give complete endorsement to the Payroll Savings Plan. But we feel that mere approval of a national thrift movement that contributes so much to the personal security of our employees and the economic stability of our country is not enough. In our continuing effort to build employee participation in our Plan, we utilize the personal contacts and enthusiasm of our enrolled Payroll Savers. A recent person-to-person canvass* by our employees *put a Payroll Savings application blank in the hands of every man and woman in our plants and offices. The result, nearly 6,000 serious savers were added to our Payroll Savings Plan."

The personal interest of executives like Mr. Steudel, and the systematic bond purchases of more than 8,000,000 enrolled Payroll Savers are reflected in the following figures:

- In March, 1954, purchases of U.S. Savings Bonds, Series E and H, by *individuals* reached $474 million, highest March figure in 9 years—a gain of 20% over March, 1953.
- Purchases of E and H Bonds, by *individuals* during the first quarter of 1954, totaled $1,380 million—the highest for any quarter since 1945.
- The *cash value* of Series E and H Bonds held by *individuals* at the end of March, 1954, was $37 billion, 175 million—the highest in the thirteen year history of the Savings Bond program.
- Payroll Savers are serious savers: over 75% of the amount of Series E Bonds that matured since May, 1951 —almost $9 billion—is still being held by individuals under the Treasury's 10 year optional automatic extension plan.
- For the third straight month of 1954, sales of E and H Bonds exceeded maturities and redemptions. The sales excess amounted to $242 million on March 31—the highest first quarter net since 1950.

If employee participation in your Payroll Savings Plan is less than 50%—or if your company does not have a Payroll Savings Plan, get in touch with Savings Bonds Division, U.S. Treasury Department, Washington, D.C. Your State Director, U.S. Treasury Department, will be glad to help you install a Plan and build employee participation.

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